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# USSR Report

NATIONAL ECONOMY

EKO: ECONOMICS AND ORGANIZATION  
OF INDUSTRIAL PRODUCTION

No 2, FEBRUARY 1987

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19 MAY 1987

## USSR REPORT

## NATIONAL ECONOMY

EKO: ECONOMICS AND ORGANIZATION OF  
INDUSTRIAL PRODUCTION

No 2, February 1987

Except where indicated otherwise in the table of contents the following is a complete translation of the Russian-language monthly journal EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA published in Novosibirsk.

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## HUMAN FACTOR IN INDUSTRIAL DEVELOPMENT CONSIDERED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 3-18

[Article by K. Kutrisov, secretary of the AUCCTU: "The Human Factor in the Strategy of Acceleration"; first four paragraphs EKO introduction]

[Text.] The 27th CPSU Congress called the human factor a decisive one in the acceleration of the country's socioeconomic development. Both its course and its pace of development depend on the interest, love of labor, discipline and creativity of the working man on the one hand, and the conditions for his labor and life, education and culture, on the other.

Since the decisions of the party congress a great deal of work has been done to study the human factor, its numerous facets and ways and methods of putting it to work. The social policy and the interests of the workers, as was emphasized in the political report of the CPSU Central Committee to the 27th Party Congress, should always be in the foreground for trade unions. But this mass organization does not always achieve militant purposiveness and persistence. Therefore on the eve of their 28th Congress the trade unions began studying their tasks and functions, and ways, methods and means of implementing them taking into account the requirements made by the party.

In this issue of the magazine trade union, scientific and production workers share their ideas, research results and suggestions that are directed toward improving management and utilization of the human factor and coordinating the tasks of increasing the effectiveness of production with increased attention to man.

The human factor plays an important role in implementing the party's strategic course--acceleration of the country's socioeconomic development. One can say without exaggeration that the main, essentially inexhaustible reserve for acceleration lies in people and in their ability and desire to work with the greatest return. Therefore all-around activization of the human factor is the major task of the day.

## The Social Policy and Acceleration

The social policy begins with observance of the principle of social justice, or more specifically, with improvement of the distribution relations and the principle of payment according to labor. It is not simply an increase in incomes, but the kind of increase that has been conditioned by the corresponding growth of labor productivity and improvement of quality of work. Thus the increase in wage rates and salaries for workers and employees in production branches earmarked for the 12th Five-Year Plan will first be carried out with money earned by the enterprises themselves. This reasonable approach is suggested by life itself: Let the wage rates and salaries be increased for those labor collectives who have earned it. Centralized funds will be used mainly to increase wages of workers in public education, public health, the sphere of culture and so forth.

Of course trade unions cannot be indifferent to those collectives that have already created conditions for changing over to the new wage rates and salaries. Here it is especially necessary to look for reserves for economizing on labor. And trade union committees in conjunction with the administration should help the labor collectives to search for and utilize these reserves.

The changeover to the new conditions for payment for labor requires significant preliminary work. The careful preparations made on the Belorussian railroad provided for high results: the plan for shipments is being fulfilled successfully and labor productivity and wages have increased significantly. They have released 12,000 workers, some of whom have been transferred to new and better technical equipment having mastered a different occupation. Others, also after retraining, have been given work at neighboring enterprises. Moreover, as a rule, the wages have not only not decreased but have even increased. This experience is useful to everyone who will be making a changeover to the higher wage rates and salaries.

Collective forms, including brigade forms of organization and incentives for labor, have proved to be an effective means of improving distribution relations. If the labor of a brigade or other collective is actually paid for according to the final result, there is no longer any room for earnings "on the side": People receive only what they have earned. In a collective where everyone is well known there is no equalizing. And here it is important to take a correct approach to the KTU--coefficient of labor participation. The mechanism for its application is undoubtedly in need of improvement, but its socioeconomic essence is obvious and definite.

Frequently the KTU is considered to be a sign of the brigade form: if they apply the KTU it means that it is a "new type" of brigade. But today it is important to look deeper. The KTU is an instrument used to develop self-management in labor collectives. Thus they become real masters and are given a guarantee of the corresponding remunerations for the results of their work. The mechanism for the distribution of earnings taking into account the personal labor contribution is completely included in the new economic mechanism, which is based on such concepts as self-supporting production and self-financing.



The KTU is also an instrument for realizing the principle of socialist distribution on a new basis: payment according to the quantity and quality of labor, and also the contribution to the collective result. This approach to distributing earnings corresponds most fully to the principle of social justice and therefore the trade unions are persistently expanding the sphere of application of the KTU.

In this connection we should like to discuss one more problem.

In some places among the so-called "specialists in competition" there is the opinion that the bonus the brigade receives from the wage fund has nothing to do with the competition. They consider the only incentive for participants to be the bonus from money allotted for these purposes from the material incentive fund. An insignificant amount is frequently given the significance of large shortcomings in material incentives for labor competition.

These superficial considerations are basically wrong. In fact today all kinds of payment for labor--wage rates, piece-rate earnings, various bonuses and additional payments for the results of labor--are simultaneously becoming incentives in competition. This is promoted by the changeover from individual to collective bonuses when the bonuses are calculated for the entire collective of the brigade and section, and then are distributed, depending on the personal labor contribution of each worker, that is, actually from the results achieved in the labor competition.

It is known that a rise in the standard of living is largely determined by the price-setting policy. Recently trade unions have increased control over the correctness of the establishment and application of prices. They have studied the work practice of executive and trade union committees of enterprises and organizations for establishing temporary resale prices for goods with improved quality with the index "N" and contract prices for especially fashionable items. A great deal of attention has been devoted to improving price setting for children's goods. As a result, taking into account suggestions of the AUCCTU, the previously adopted policy of establishing temporary retail prices for new children's goods with improved quality with the index "N" has been abolished and retail prices have been reduced for a number of goods in the children's assortment. Trade unions will continue to participate actively in the implementation of the party policy in the area of price setting. And its essence, as we know, consists in giving prices more flexibility and coordinating their level not only with expenditures, but also with the consumer qualities of the goods, the effectiveness of the items, and the degree of balance of the products that are produced with social needs and the demand of the population.

The labor activity of the working man is determined largely by the conditions in which he works. It is a simple truth. How is it taken into account? During the 11th Five-Year Plan on-the-job injuries decreased by 20.3 percent and occupational diseases--by 25.7 percent. On the basis of technical reequipping working conditions have been improved for 15.5 million people. The figures are impressive. But they cannot offset the large shortcomings in this work. In some places, with the complicity of the trade union committees



and the trade union technical inspection teams, deviations from the requirements for the protection of labor are allowed and causes of repeated accidents and injuries are not eliminated. No serious improvement has been made in the creation of safe technical equipment and technology. Of the 18,500 machines and mechanisms tested by the trade unions, more than half do not meet the safety standards. Sometimes new technical equipment even worsens working conditions.

There are still enterprises that have no place to change clothes or take a shower or to eat, medical and domestic services are partly arranged, and conditions have not been created for full-value recreation during meal breaks. There is no need to prove that under these conditions the human potential cannot be fully disclosed.

The AUCCTU has set for trade union councils and committees the task of increasing the demands placed on business executives for making the working conditions in the work places correspond completely to sanitary norms in the shortest possible periods of time and bringing order into the work of plant dining rooms and off-duty premises. It will also be necessary to provide all workers with cloakrooms, showers and washrooms. Is this realistic? The experience of the leading enterprises that are successfully solving these problems makes it possible to answer this question in the affirmative.

Another large problem is relieving workers of heavy, less attractive, unprestigious work. Here it is important to provide for further fruitful activity of people without limiting them either morally or materially. It is also necessary to find a mechanism that will motivate designers, technologists and planners to orient their developments mainly toward man and the conditions for his labor. The corresponding decrees regarding this exist but, unfortunately, there have not been any large positive changes yet.

The cornerstone of our social policy is concern for people's health. During the past 5 years with the active participation of trade unions a good deal has been done to expand the scope of work for health improvement. As a result losses of working time because of illness have decreased somewhat, which is tantamount to average daily attendance at work of 100,000 people. But there are still many shortcomings here. It is far from everywhere that this work is being done comprehensively and purposively.

An important and not yet completely solved problem is housing. It seems that extensive enlistment of labor collectives in housing construction using their own money and expansion of the construction of individual and cooperative residential buildings will serve to solve this problem.

Great reserves for accelerating the solution to problems of improving conditions for the labor and life of the people lie in the utilization of these possibilities. The aforementioned aspects of the social policy along with all the others have been, are and will be within the purview of trade unions.

## Scientific and Technical Progress and Man

The trade unions should increase their influence on prompt fulfillment by the branches--mainly those that determine scientific and technical progress--of assignments for restructuring of production, complete and effective assimilation of new capital investments allotted for these purposes, reduction of time periods for the development and introduction of new technical equipment, improvement of the utilization of existing capacities, and the formation of a highly skilled cadre of personnel.

But a successful resolution to these problems, as was already noted, is impossible without constant attention to social factors--the conditions for the labor and recreation of the workers, their daily and medical service, and so forth. Here is a concrete example. At the 27th Party Congress a veteran of the Stakhanovite Movement, K. Petrov, discussed the fact that for several decades miners have been requesting that the mechanical pick be replaced. The use of outdated technical equipment leads to large losses of output and has an unfavorable effect on the health of the miners. Moreover, the USSR Ministry of the Coal Industry has many specialized scientific research institutes and a plant engaged in the production of mining equipment. But the problem has not yet been solved. Academic science has come to their assistance--the Institute of Mining Affairs of the Siberian Branch of the USSR Academy of Sciences has created better equipment, but it has not yet been accepted for production. What is the matter? Inventors, designers, and technologists are creating many of the most advanced developments, but they do not find their way into production. Why? It is clear: there is no mechanism that would motivate and interest the developers and production workers. And even if something new is introduced, it is frequently very slowly and much of the time it is utilized inefficiently. The reason again is the low motivation and the poor organization of labor.

A large amount of work is now being done to improve the economic mechanism and management. And the trade unions can do a great deal here, the more so since they have a certain amount of experience in this area. In Kharkov Oblast, on the initiative of the trade union council and the organizations of scientific and technical societies, temporary creative collectives that brought together scientists and production workers were created and are operating successfully. Their task is not only to solve crucial scientific and technical problems, but also to introduce developments into production. The basis of the activity of these groups are orders from enterprises and cost-accounting relations.

The councils of the NTO's [scientific and technical societies] of the Svetogorsk and Syassk Pulp and Paper Combines and the Moskva Furniture Combine have taken responsibility for scientific and engineering support for technical reequipment of production. The central council of the VOIR [All-Union Society of Inventors and Efficiency Experts] along with the State Committee for Inventions and Discoveries organized at the Exhibition of the Achievements of the USSR National Economy an exhibit of 500 highly effective but poorly utilized inventions. The exhibit attracted the attention of leaders of ministries and a number of developments are already being introduced into production.

The Poltava Oblast Trade Union Council, on the basis of a similar exhibition of means of minor mechanization, in conjunction with managers of enterprises in the oblast, was able to organize extensive utilization of this equipment.

Operating under the USSR Gosplan is an Interdepartmental Commission for Questions of Introduction of Especially Important Inventions Into the National Economy. It was formed on the initiative of the AUCCTU, it has great capabilities and, as practice shows, it is capable of "breaking down" the notorious departmental barriers.

Another thing is also important in these examples. In practice we have an effective combination of state and social foundations and a real embodiment of democratic principles of management.

But on the whole the scientific and technical societies and the All-Union Society of Inventors and Efficiency Experts, working under the leadership of the trade unions, are a powerful public sector of science and technology. Their activity is directed, on the one hand, toward acceleration of scientific and technical progress and the utilization of its achievements in practice and, on the other, toward the development of the creative capabilities of the workers.

Today the trade unions are faced with the task of making maximum use of the immense creative potential of this social sector. But behind it again we must see man--the activist, the motive force, the innovator and the inventor, who must be motivated, for whom it is necessary to create "the most favorable conditions." And stimulation of creative labor plays far from the last role in this.

One must admit that today the system of incentives for promoters of scientific and technical progress is far from perfect. What kind of passionate desire to make their contribution and what kind of civic awareness must the authors of inventions and discoveries and efficiency experts have in order, frequently entering conflicts and expending a great of physical and spiritual energy, to "push through" the introduction of their brainchild which produces a considerable profit for the state? In order to receive the remuneration he has coming, the inventor must frequently go to court, but even there, if the sum is expressed (and quite justifiably) in an amount of several thousands of rubles, there is some doubt: how can one give so much money to a worker all at once for one job?

This situation must change radically for otherwise how can we speak about the principle of social justice?

It would seem that the system of incentives for the activity of the inventors and efficiency experts that is being applied in a number of socialist countries is worthy of attention. In Bulgaria, for example, there is a competitive selection of labor collectives, groups and individuals for participation in solving crucial scientific and technical problems. Special funds for encouragement for the winners are created under a planned policy.

It is also necessary to discuss the role of individual innovators and inventors. Of course, today the majority of discoveries and large inventions are the fruit of collective labor, and this is predictable, taking into account the complexity of the problems that are being resolved. But it is clearly incorrect to abandon even the very possibility of the participation of individual workers in the acceleration of scientific and technical progress. Yet such a view exists, including among managers. And yet practice provides a mass of examples of unique, highly effective developments that are created by individual inventors. Our country is not lacking in talent. It must be supported in all ways and encouraged in a worthy manner.

The human factor is present and largely determines the success of work for restructuring the economic mechanism. There is no doubt that the new mechanism will provide additional acceleration, but this will not take place automatically. Analyzing the results of the large-scale experiment we were convinced that its goals and tasks have not yet been transmitted to each specific worker. Here is where one finds a broad field for the activity of trade unions, which was discussed, particularly, at the last plenums of the AUCCTU.

The human factor also means new thinking. We are convinced of the need to look at many things in a new way the analysis of the results of the Novosibirsk Experiment in applying the collective contract in sections, shops and other structural subdivisions, which was conducted in keeping with a decree adopted by the USSR State Committee for Labor and Social Problems and the AUCCTU Secretariat. One might hear, for example, that the contract contributes to retaining personnel. All this is correct. We need to stabilize our collectives. But then does one always pay attention to the fact that new technical equipment and technology, as a rule, should be accompanied by a reduction of the number of personnel? Artificial stabilization in such a case retards the growth of labor productivity. Consequently it is necessary to think about flexible collectives whose number is constantly being adjusted as a result of increased labor productivity on the basis of scientific and technical progress as well as the organization of an effective system for retraining and placement of workers who have been released. This is a very important problem that lies directly in the sphere of the functions of the trade unions. With the introduction of new technical equipment it is necessary not only to retrain personnel and to increase their qualifications, but at the same time to solve problems related to the utilization of labor resources that are released as a result of the introduction of highly effective equipment and technologies. In other words, we are speaking about the social consequences of scientific and technical progress.

#### The Development of Democracy in Production

The deep restructuring that is taking place in the country has placed on the agenda of immediate tasks the need for expansion of democracy in all spheres of the life of our society and the development of habits of working under conditions of expanded democracy and the desire to learn to work in a new way.

Yet some people continue to place their hopes in the idea that the discussions of expansion of democracy are just another campaign and that in one situation



or another, in order to solve the problem, it is sufficient to put the "state machine" into operation and things will work out. And even the slogans conceal the idea that we must give preference to state and social interests over individual interests. But what are state interests if not an interweaving and combination resulting from individual interests?

Today we have witnessed the process of gradually transforming forms of participation of workers in the management of production into production self-management. The USSR Law Concerning Labor Collectives and Their Increased Role in the Management of Enterprises, Institutions and Organizations should contribute actively to the development of this.

Unfortunately, as was noted even at the meeting of secretaries of the CPSU Central Committee and managers of industrial associations and enterprises, kolkhozes and sovkhozes, production brigades, specialists and scientists in 1985, we have not yet received the proper return from the expansion of the rights of the labor collective.

The potential rewards from self-management, of course, cannot be realized immediately. Interesting experience, for example, was demonstrated by the USSR Ministry of the Chemical Industry. At a number of its enterprises when appointing directors, head engineers and deputy directors they take into account the opinion of the workers as expressed at meetings of representatives of collectives or at general meetings. As a result the moral-psychological climate and the activity of the collectives have improved. A similar thing is done at a number of enterprises of the Georgian SSR and in several other regions.

The one who actually controls is the one who has the resources at his disposal. Now the wage fund and the economic incentive fund, in whose distribution the labor collectives participate, comprise an extremely significant proportion of the country's national income. Distributing them strictly in keeping with the principle of social justice brings about a strengthening of the responsibility of labor collectives and hence increased activity on the part of the masses.

Collective agreements are a way of testing the realization of the democratic rights of the workers. It should be noted that while utilizing the authority granted by the law the labor collectives have increased control over the fulfillment of contractual commitments and are more serious about holding responsible those people who have not provided for observance of these commitments.

At the same time, as before, we cannot be satisfied with the state of affairs with respect to the realization of collective agreements. In 1985 alone more than 544,000 commitments and measures remained on paper. And behind these lie many unsolved production problems and social measures that have not been fully implemented. The conclusion suggests itself. Trade union agencies from below to above must change their style of work for guiding the conclusion of collective agreements, and checking on their fulfillment, keeping in mind that no piece of paper will ever replace live organizational work directly in the labor collectives where these agreements are formed and where they live and

act. Only this way will we be able to be rid of formalism and achieve their complete realization.

Certain problems on the path to the development of socialist self-management also arrives outside the framework of the labor collective--at the regional, branch and national economic levels. Today the same decisions are frequently being taken in parallel by both state and public organizations. Take, for example, the scientific and technical creativity of the workers. This is being handled by the USSR State Committee for Science and Technology, the USSR State Committee for Inventions and Discoveries, the USSR Academy of Sciences, and a number of other departments, ministries, trade unions, the Komsomol, the VOIR and the NTO's. And as a result, as frequently happens, too many cooks spoil the broth. There is a similar situation in the area of culture, physical culture and sports, tourism, recreation, and departmental and public control.

The creation in the future of public-state agencies for managing individual social spheres could contribute to eliminating this kind of duplication and at the same time to unifying more closely the efforts of state and all public organizations. This would mean a real step in the deepening of democratic foundations and direct democracy.

At the 27th Party Congress they raised the issue of having a council composed of representatives of the administration, party, trade union and Komsomol organizations, brigade councils, workers and specialists, function during the period between general meetings of the collective of the enterprise. The AUCCTU is searching actively for the best ways to carry out this instruction.

Democracy in production is manifested most clearly in collective forms of organization and stimulation of labor. I have already said that the brigade form through the coefficient of labor participation brings everyone into the exercise of one of the most important state functions--control of distribution relations. The leading cost-accounting brigades are now already becoming primary units in self-management and selecting their own leaders. In the near future it will be necessary to extend this selectivity to all brigade leaders and then gradually to the foremen and chiefs of shifts, sections, shops and so forth. The leader of a brigade of fitters of the Moscow Machine Tool Building Plant imeni S. Ordzhonikidze, A. F. Shumilkin, clearly formulated the essence of collective forms of organization and stimulation of labor: "I think that business executives are not only the directors of the plant and shop chiefs, but also we brigade leaders and workers of brigades. To be sure, our area is smaller. But this does not reduce our responsibility for the business."

Practice provides many examples of active participation of collectives of brigades, sections, shops and enterprises in carrying out such an extremely important function of management as planning. At a number of enterprises of the Ministry of the Shipbuilding Industry plans for brigades are not "sent down" from above, but are made by the collectives themselves. The collectives of shops of the Novosibirsk Chemical-Pharmaceutical Plant are participating in an experiment in applying the collective contract and submitting to the administration their own production plan in whose substantiation workers, economists, technologists, foremen and shop chiefs have participated.



I have touched upon only a small range of issues in the emergence and development of socialist self-management. On the whole a considerable number of them have accumulated. How to combine self-management with the principle of one-man management, what changes should take place when changing over to the selection of managers in legislation and the organization of production, labor and management? The times demand that we answer these questions as quickly as possible.

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#### AUCCTU SECRETARY KAZAKOV INTERVIEWED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 19-27

[Interview with L. D. Kazakov, secretary of the AUCCTU, hero of socialist labor, by B. P. Kuttyrev: "We Can Do a Lot Ourselves"]

[Text] Leonid Davydovich Kazakov quite recently participated in the construction of the Baykal-Amur Mainline and was in charge of a brigade of workers. In December 1985 he was elected secretary of the AUCCTU. The sphere of his duties now include the participation of trade unions in solving housing problems and organizing public catering and municipal-domestic services for the workers. The reader will probably be interested in the opinion of yesterday's worker who today is one of the leaders of the trade unions concerning the development of the social infrastructure, particularly housing.

[Question] Leonid Davydovich, quite recently your role changed abruptly. Previously it was as though you had the right to demand various goods for yourself--in exchange for labor, of course, but now the same goods are being demanded from you. Did this happen because of some kind of change in values and if so, what did it consist in?

[Answer] In terms of the idea a reestimation should have taken place. In fact: yesterday you made the demands, and now the demands are made of you. I personally was convinced long ago that the social sphere at the enterprise--housing, food, daily life--bothers everyone and comes into the foreground. Wages alone, regardless of how much they may increase, are not enough for the working person. He needs an occupation and a specialty that is a little more interesting so that he can, as it were, "reveal himself" in them. And, of course, the working conditions must be normal, there must be someplace to eat tasty food quickly, to take a shower, to change clothes, and medical and domestic services must be organized. And here in the AUCCTU we have that same orientation and that same understanding. Such is the task set by the April (1985) Plenum of the CPSU Central Committee and the 27th Party Congress. So I think the same thing now as I did before: the social aspects should be in the foreground.

[Question] But even with the same understanding of the problem the approaches to its solution can vary. Everyone agrees, say, that the social structure

should develop at more rapid rates. But some are solving these problems while others are waiting until somebody else does it.

[Answer] I understand the question. Indeed, certain workers, even labor collectives, have a certain dependent attitude toward particular goods. Act now and worry later--that is their credo. They invest their work, they are not loafers, but their housing, food and daily necessities must be provided for them by a "rich uncle." If they were to engage in these things themselves the situation would change for the better.

[Question] Does that mean that you think the main thing is to enlist the workers themselves in actively solving problems of housing and daily necessities in production? Have you already done something in this direction?

[Answer] At the 27th Party Congress the chairman of the AUCCTU S. A. Shalayev made a suggestion concerning the development of an all-union program for improving housing conditions of the population. After the congress the decree of the CPSU Central Committee, "On the Basic Directions for Accelerating the Solution to the Housing Problem in the Country," was adopted. Recall the exhibits at the All-Union Exhibition of the Achievements of the USSR National Economy, "Daily Production Life--In Their Own Hands." The Presidium of the AUCCTU approved a plan of practical actions for trade unions in the area of daily life. If the Basic Directions for the Economic and Social Development of the USSR During the 12th Five-Year Plan envisioned introducing 565-570 million square meters of housing, the trade unions suggest introducing 595 million. If one takes the upper figure the introduction of housing will increase by 25 million square meters. I would call this an estimate of the return from initiative and an indicator of a departure from the dependent attitude.

[Question] Where did the figure 25 million square meters come from? After all, the Basic Directions were developed and prepared by competent agencies and organizations that have their own scientific research and planning institutions. An average of 5 million additional square meters a year--this is not just a couple of dozen residential buildings.

[Answer] Do you think that the suggestion is unrealistic? Here are a couple of arguments to support it. First, in the aforementioned decree of the CPSU Central Committee it is pointed out that the ministries and departments, local party, soviet and trade union agencies and business executives do not devote enough attention to the development of the social infrastructure, they have become accustomed to regularly failing to fulfill the plans for housing construction and they do not exercise proper control over prompt and regular introduction of housing and facilities for social and cultural purposes. The capacities of home-building enterprises are utilized poorly. Taking into account how seriously the party takes strengthening of state and party discipline, one can confidently see reserves in increasing the rates of housing construction.

Second, with an average level of provision of housing of 14.5 square meters per capita, the range is still great. Consequently, it is necessary to solve the problem of fair distribution. Moreover, not all housing is utilized

efficiently. Work for preserving the housing supply and reconstructing and renewing it is poorly organized. A number of places allow unjustified raising of buildings that are suitable to be lived in. About 5-6 million square meters are subject to demolition.

Third, and this is the most important, we have calculated the need. With the initial plan the country would be able to provide each family with a separate apartment by the year 2000. But since there is a need, the one with the need should be interested in solving it. We placed our main hopes in this.

[Question] How did the AUCCTU determine the need? Relying on its own scientific research base? What kind of base is this?

[Answer] Of course we went to those specialized agencies and organizations that developed the predictions concerning housing for the party congress. We proceeded from the idea that the corresponding institutes had calculated the capabilities of the state as a whole, without fully including the potential capabilities of the labor collectives and the human factor. The trade unions insist on observing the major principle--orientation toward these possibilities. Subsequently various proposals were made along with those of specialized agencies and organizations.

[Question] Where do the proposals mainly come from?

[Answer] I should say immediately that they do not come only from offices. During the course of the discussion of materials for the party congress and after it, we received many letters from the local areas containing calculations: How many people are on the waiting lists, how many people live in dilapidated housing, in family dormitories and in subdivided premises, what rates must be maintained in order for each family to have its own apartment or individual building by the year 2000. It was persistently repeated: What has been planned is not enough. It is necessary and possible to assign more. It was explained how this was "possible." The AUCCTU asked the opinion of the corresponding trade union councils and gathered together the directors of a number of large enterprises and deputy ministers in charge of construction, including housing. Having consulted directly with the labor collectives the brigades traveled to the local areas, brigade members made contact with the Gosplan and the ministries, and science was included--the Academy of Municipal Services and Gosstroy Institutes. In other words, an immense amount of preparatory work was done. And one of the most important conclusions was that there is an immense amount of reserves in local areas, in labor collectives and among those who wish to receive housing.

[Question] What is the main source of these reserves?

[Answer] First of all, construction of housing through the internal financing method. The internal financing method reflects both accounting for and utilization of local resources, on the one hand, and initiative and the desire of the direct participants in production, on the other. Let us take the brick plant and the home construction combine. We ask: Are the capacities being fully utilized? The answer, as a rule, will be negative. For instance, enterprises of the construction industry are working on two shifts. What is

lacking for the third shift? If it is workers, then the enterprises and organizations in need of housing form construction brigades, sections and even shops. The trade unions help to disclose the needs and resources and coordinate the actions of the interested parties.

For example, the AvtoGAZ Production Association, having gained the support of the party obkom, the oblast trade union council and the workers, made a suggestion to put the housing construction combine on its books and carry out its reconstruction. The products that previously went to the city would still go for its needs, but the increase would go to the association. Up to 100 people a year are sent as finishers, electrical installers, painters, carpenters, and cabinet makers to the contracting construction organizations of Glavvolgvyatskstroy, thus helping to accelerate the process of release of the buildings. Special attention is devoted to plants that produce construction materials, some of which the AvtoGAZ receives for itself.

[Question] Is there not a departure from specialization hidden behind this kind of development? The machine-building enterprise gradually becomes a self-supporting business: it produces its own construction materials, it does its own construction, it finishes its own work, it repairs and installs its own housing supply. It has its own agriculture and feeds itself. Would it not be more reasonable to rely on specialization which is more justified economically?

[Answer] An age-old question. I shall not discuss "pure" specialization, its organizational and economic aspects. The social side is important: the enterprises find reserves within themselves for engaging in kinds of activity which are "not in their profile," but which are necessary in order to satisfy the needs of all the workers. Is this really leading the business to "self-sufficiency"? Imagine the opposite: the automotive builders specialize "purely" and know only how to roll cars off the conveyors and although they do not have enough housing and the food in the dining room is not very good, they do not construct a subsidiary farm and do not work on it. Thus the requirement of specialization will be observed, but will this satisfy them? We are speaking not about making the business self-sufficient, but rather about using their own efforts directed toward better satisfaction of their needs. This way, incidentally, branch narrowness is also overcome, which is also very important.

[Question] One can agree that narrow specialization cannot be introduced quickly, that it is impossible all at once to reach a point where the construction workers provide everyone with an apartment and agricultural workers provide plenty of food. In such conditions it seems justified to search for and utilize reserves of enterprises of other branches. But does such a temporary solution not generate dependent attitudes among those that lag behind, and does it not reinforce the existing situation?

[Answer] Once I participated in a discussion. It was about that fact. At AvtoGAZ they held a competition for the creation of a youth housing complex (MZhK). From the results they formed two construction detachments of 500 people and two sections of the complex. In 2 years it was intended to introduce 1,000 apartments for youth. This problem arose: the members of the



detachment would be absent from their jobs for an entire year. Moreover, the production plans were not removed, and those who were left had to fulfill them. One might ask if the number of workers in the collectives had not been increased? There can be two answers. In the first place, if it is yes, the redistribution of labor that took place from machine building to the construction industry or to construction was economically justified. If the answer was no, it is the same as revealing and using additional reserves of the machine builders, which also characterizes an intensive approach to management.

[Question] Leonid Davydovich, an MZhK detachment of 100 young people was sent from the Akademgorodok of the Siberian Branch of the USSR Academy of Sciences to a housing construction combine for a year. These were workers of academic scientific research institutes, laboratories and design bureaus. Their work is scientific and theoretical, and involves planning and design developments, but at the housing construction combine they produce panels and other parts of buildings. Of course the detachment is useful and very much so. The young people comprised an entire shift and in a short period of time, because of their initiative, endurance and engineering knowledge they were declared "masters" in labor productivity. But did we not lose more of what they would have created with their instruments, at their drawing board, at their drafting tables or at their desks in their offices?

[Answer] I am not a specialist in calculations of economic effectiveness. But if these were to be done I would advise placing on the scales two fundamental social effects. First, the young scientists, designers and planners will receive apartments--the greatest benefit as of today. They will receive it quickly and with a guarantee. Is an apartment not necessary for energetic creative activity on the part of the members of the detachment? Is their output not greater than what could be obtained from people who are living in dormitories or renting a corner of a room? Second, and this pertains directly to the subject of our conversation, the housing is not given to the youth but is created through their own labor. Moreover, those who have worked for a year in a housing construction combine have augmented their experience in life and production, have experienced for themselves the labor of a worker, and have been able to use their engineering knowledge and practice. It is difficult to overestimate this effect from respecialization (that is what I would call this phenomenon). This is what characterizes, in particular, the overcoming of branch narrowness which I have already mentioned.

You have mentioned the experience of the Gorkiy automotive construction workers several times. What is special about it?

[Answer] The AvtoGAZ experience has been considered repeatedly in trade union organizations. If housing construction resources were divided into organized (official) and unorganized (internal), the association has placed special emphasis on the latter category. The results are appreciable. In 1981 98,000 square meters of housing were constructed here and in 1985--110,000 square meters. The appetite, as they say, comes at dinnertime: a decision was made to provide an individual apartment for every employee not in 15 years, that is, before the year 2000, but in 10 years, introducing 200,000 square meters a



year. Participants in the meetings in the collectives voted unanimously in favor of the program. It was preliminarily calculated how many people were waiting, how many were living in dormitories and how many decrepit buildings would be demolished. A base was determined--the GazremstroyMontazh Trust, whose work volume by the internal financing methods would increase from 35,000 to 75,000 square meters a year. I have already discussed the other areas. One more fundamental point is the readiness to give free time to the construction project, for example, on Saturdays. This amounts to a half-million man-days.

There is another detail I do not wish to leave out. The association has already erected two buildings for veterans and a third with 420 apartments is being prepared. They have medical points, common rooms, in a word, they are social centers. As a rule, veterans occupy dwelling space in excess of their needs. They release these apartments when they move into the new buildings.

[Question] The automotive plant does everything that counts in Gorkiy--a city with more than a million people. Is this giant not taking opportunities away from the rest?

[Answer] Practice does not allow mistakes: the reserves are such that not only AvtoGAZ, but also all the other enterprises and organizations of Gorkiy and any other city are incapable of exhausting them. Because the human factor and the initiative of the masses essentially cannot be exhausted. There is nothing to fear here. On the other hand, it would be expedient to coordinate the programs of individual enterprises. For example, the way this is being done in Ulyanov Oblast, where the party obkom has instructed the oblast trade union council to solve the problem of providing garden buildings. Land has been allotted for garden plots, the sequence has been determined, there is a breakdown for the various years, and the construction base has been reinforced. In 1986 it was intended to construct 15,000 plots with buildings of six types valued at from 600 to 2,000 rubles. An oblast comprehensive program was developed to construct these garden buildings. The resources for it were local. It was intended to construct a cement plant and a Carbolite plant as well as other capacities. The enterprises are allotting metal and other materials that are in short supply. A great deal of attention is being devoted to using them as economically as possible: after all, they are taking them from themselves and using them for themselves.

It is easier to develop this work within the framework of the oblast or kray. In one place there is a brick plant and in another place there is a deposit of clay or sand that can be used. If one enterprise does not keep up the others help it. Together they invest money in one enterprise, reorganize it, and then others will develop using these capacities.

[Question] Leonid Davydovich, you have given some good examples. But are they not individual, random examples?

[Answer] The initiative of the GAZ collective has been taken up by workers of hundreds of enterprises. Many collectives have enlisted in the movement "Our Life--In Our Hands." What we have discussed shows the rich possibilities of doing something for oneself. I think that today there is no place for a

dependent approach. Everyone can see and is convinced: a good deal can be done for oneself in order to satisfy one's own needs without waiting for help from the outside. Such is the radical change in our way of thinking and acting.

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## PROGRESS IN SEX DISCRIMINATION DISCUSSED

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[Article by G. F. Sukhoruchenkova, AUCCTU secretary: "The Goals of Female Labor"]

[Text] At the end of 1985 in Moscow at a press conference for Soviet and foreign journalists on the subject "Real Socialism, Democracy and Human Rights," a member of the Committee of Soviet Women, a weaver at the Moscow Silk Combine imeni Shcherbakov, Hero of Socialist Labor M. D. Polyschuk was asked a question: "What do you think about the rights of women in the Soviet Union--is this just a slogan or is it a reality?" Mariya Dmitriyevna gave a good answer. She, a peasant girl from a family with many children, who was elected a member of the Moscow City Committee of the CPSU, a deputy to the USSR Supreme Soviet and a delegate to three subsequent party congresses had only to discuss her own life and destiny in order to answer this.

If a journalist at a press conference had asked me such a question I would have answered: there is no reason to juxtapose a slogan (that is, a principle) and reality in terms of equal rights. There is an undoubted reality which, in turn, stands in opposition to dogma.

And now on the eve of the 28th Congress of Soviet Trade Unions I should like to think about dogma and reality.

### Qualitative Changes

Scientific and technical progress, improvement of methods of control and management, and changes in social relations are reflected in different ways in men and women. The reasons are both objective and subjective. New machines and technologies, for example, can present different kinds of danger for the health of men and women. Do the designers, technologists and economists take this into account? Far from everywhere and always. Having firmly adopted the principle of equal rights they can still forget about the need to take it into account in their activity. This is what needs to be remembered.

I have repeatedly had occasion to hear from well-known production workers that the main road to increasing labor productivity is conveyor production.

Including in the foreseeable future. We are well aware of the merits of the conveyor in the area of economics. We also know its shortcomings: the monotony, the low level of skill and thus the low earnings and uninteresting work. But let us look even deeper: these shortcomings are being "feminized." For conveyor labor for various reasons is basically the "female prerogative." It is women who are still willing to do it. In the future they too may become unwilling. What will the businessmen say about this? Will they insist on the merits of conveyorization as before or will they recall the principal of equal rights?

I shall give one more example as an illustration. Today all of us--economic agencies and trade unions engaged in carrying out the party assignment for increasing the shift work of equipment--are looking for the necessary approaches. We have a choice here. But there is also a danger that instead of relying on scientific and technical progress, at the enterprises and organizations they will take the "tested" path and begin to enlist mainly women for the second and third shifts. After all, men even today are receiving acceptable earnings by working one just one shift. For example, in machine building. In the political report to the 27th CPSU Congress it was noted that the party in conducting its policy counts on the support of all classes and social groups of our society, including women. There is no doubt that the party can firmly rely on the "better half" of the workers. But the problem is to make sure that this support is reasonable and is an economically and socially justified area of activity, so that nobody will worsen the conditions for the labor of women and thus introduce a disbalance into equal rights.

#### A Step Forward

The complete political and economic liberation of women, their interest in labor, the availability of education and professional training, the granting of jobs in keeping with the specialty, the rendering of assistance in rearing children, and the desire of women for economic independence in the family and cultural growth--all this determines the high level of employment in public production.

But it is not merely a matter of quantitative growth. The labor of women has changed qualitatively as well. They comprise almost half of all the workers employed in mechanized labor. They are accounting for a larger share of workers in such creative occupations as equipment adjusters, operators, equipment operators, machine and vehicle mechanics and so forth. Among the branches of industry the most women are now employed in precision machine building and the radio industry. And this is no accident: these branches are the most highly mechanized and automated, and the nature of labor in large mass production makes it possible to achieve a corresponding between working conditions and the work place, on the one hand, and the physiological peculiarities of the female organism, on the other.

Scientific and technical progress makes radical changes in the occupational-skill structure of the labor of women, intellectual labor is increasing, and the work of every third women in the national economy is linked to mental labor.

Trade union agencies regularly check on the observance of legislative acts concerning labor and the condition of the protection of labor and the health of women. During the years of the 11th Five-Year Plan on the basis of technical reequipment of production, progressive changes in the organization of labor and the implementation of target programs for reducing manual labor as well as comprehensive plans for improving the working conditions and sanitary-health measures, working conditions were improved for 6.7 million women, 465,000 were released from performing heavy physical work, and 273,000 female workers were released from work at night.

A significant role in facilitating and improving the health conditions for the labor of women was played by the introduction of reduced norms for maximum permissible loads in lifting and moving heavy objects by hand. I recall well all the ins and outs of the struggle to revise the norms that were established as long ago as 1932. On the basis of organizational and technical measures for priority mechanization of manual work, in which mainly women were employed, and also as a result of the changes in branch standards and normative-technical documentation during 1983-1985, new norms were introduced for 985,000 women.

But it is not labor alone that distinguishes the Soviet woman. Her social prestige is linked not only to her participation in public labor but also to her active role in the family as a mother, wife and homemaker.

During the years of the 10th and 11th Five-Year Plans there was further improvement in legislation and practical measures were taken to protect the health of mothers and increase state assistance to families with children. Additional benefits were established: for paid vacations and caring for a sick child; state assistance to children disabled since childhood was increased; provision of textbooks free of charge for children in general educational schools was introduced; and norms of expenditures from the state budget for maintaining birthing homes and children's hospitals were increased.

State expenditures on education in schools and service for children in children's homes, day nurseries, Pioneer camps and institutions and for extracurricular work with children comprise 60 percent of all expenditures from the state budget on education. Each year the number of children's institutions is increasing. From 1940 through 1985 it more than tripled and the number of children in them increased by a factor of more than 7. During the years of the past five-year plan kindergartens and day nurseries to accommodate 3 million were constructed, so the overall number reached almost 16 million.

I repeat that children in every Soviet family has a summer vacation. In 1985 Pioneer and school camps, excursion and tourist bases, dachas of kindergartens and day nurseries admitted more than 25 million children and adolescents during the summer. In 1983 a new benefit was introduced: 50 percent of the overall number of passes to Pioneer and other health camps to schoolchildren are offered to workers, kolkhoz workers and employees free of charge, and the rest are issued with a payment of 20 percent of their value.



Health resorts for family recreation and sanatorium treatment for parents with children are especially popular. During the past 5 years the number of accommodations in them has increased fivefold.

The social program developed at the 27th Party Congress is even more multifaceted. An important place in it is occupied by measures directed toward creating conditions that make it possible for women to successfully combine maternity, labor and public activity. Special attention will be devoted to the protection of maternity and childhood: the length of the pregnancy leave will be increased as will the leave for caring for the child. The network of sanatoriums, houses of recreation and boarding institutions for family recreation will expand. Various specific forms of labor employment for women will be developed and sliding work schedules, part-time work and home work will be used more extensively if they wish it.

Under the 12th Five-Year Plan the length of the paid vacation for mothers to care for their children until they reach 18 months will be increased as will the number of paid days when a child is ill. Underprivileged families will begin to receive stipends for children up to the age of 12. A task has been set even in the next few years to completely satisfy the needs of the population for children's preschool institutions.

In keeping with the five-year comprehensive plans and the programs entitled "Health," it is intended to bring the working conditions of all women in line with the requirements of the norms and rules and to release them from heavy labor. In our opinion, this work should be started as quickly as possible.

#### Designers and the Labor of Women

With all the diversity of forms, methods and areas of activity of the party, state, trade unions and other public organizations which is directed toward improving the conditions for the labor, life and health of women, still far from all problems have been solved.

I shall take this aspect. Women's specialization depends more than men's on physiological and psychological peculiarities, on the availability of work places with favorable working conditions, on the degree of provision of cultural and domestic services, and on the granting of privileged conditions for labor, recreation and other socioeconomic conditions.

The major prerequisite for efficient and effective utilization of female labor (like the labor of men) is scientific and technical progress. But the lack of uniformity in the application of its achievements among the various branches and productions and, in a number of cases, the lack of a systematic approach in realizing them, the underestimation of the requirements of ergonomics when creating new technical equipment and technology, and the incompleteness of measures for mechanization of work lead to the preservation and sometimes even the appearance, where it did not exist before, of heavy physical and manual labor, production factors that are harmful to the health, increased nervous and emotional strains, and impoverishment of the content of labor.



As a result, we do not have enough jobs and sections that are sufficient for the existing employment of women where their labor can be applied efficiently. Hence the serious arrears in the occupational structure of female personnel. Among the occupations with physically heavy and unskilled labor the proportion of women still remains high: they comprise 58 percent of the overall number of workers employed in manual labor in industry. The proportion of women employed in manual jobs has increased in machine-building and metal processing, electric energy engineering, the construction materials industry, nonferrous metallurgy, bread baking, and the fruit and vegetable, meat, fish and a number of other branches. Moreover, as I have already noted, they are being released from this kind of work at much lower rates than men are. A tendency has developed in the national economy which we cannot regard with a positive attitude: men who have been released from manual and unskilled jobs are "politely" giving their places to women.... During 1982-1985 in jobs performed by hand but with the help of machines and mechanisms the number of men in industry increased by 17,000 and the number of women decreased by 41,000, amounting to 45 percent of the overall number of these workers.

The lack of balance in the rates of mechanization of basic and auxiliary processes is brought about by the fact that the problem of employment in auxiliary production has become mainly one for women. Among the auxiliary workers, warehouse personnel, scale operators, pantry workers, packers, sorters and controllers women comprise up to 88 percent. Since these kinds of work are the most widespread for primarily female labor and they can be found in all branches of industry, the task of mechanizing them becomes extremely crucial and could produce the greatest effect in releasing women from manual work.

I should like to emphasize this circumstance as well. A considerable proportion of manual in auxiliary production is heavy labor. The most unfavorable situation is found in such mass occupations as railroad workers, switchmen, and track installers--in rail transportation; brick lifters and layers in the production of construction materials; sales personnel, packers and expeditors--in trade. This situation can be explained largely by the lack of attention to these issues on the part of ministries and managers of enterprises, the poor organization of the necessary measures, and the passive position of trade union committees.

But the main cause is the poor provision of lifting and transportation equipment and means of minor mechanization for enterprises and organizations. The need in rail transportation for highly productive track vehicles, for example, have been satisfied for only 35-40 percent for a long time. The production of economical kinds of containers and packaging is advancing slowly. The AUCCTU and the USSR State Committee for Labor and Social Problems have requested that the government envision in the current five-year plan an increase in centralized output of lifting and transportation equipment and means of minor mechanization for branches with a high level of employment of women in manual jobs.

The reduction of the number of women in manual and unskilled jobs is a most important national economic task, on whose solution not only technical but also social progress depends. It must be resolved on a statewide scale: the

experience of the past 10-15 years convinces that the efforts undertaken at the level of individual branches will not produce the desired results.

As early as 1979 the Soviet government made it incumbent on the Gosplan, the State Committee for Science and Technology, the Gosstroy and the State Committee for Labor and Social Problems, with the participation of the ministries, to develop a program for reducing the application of manual labor during the period up to the year 2000. It was suggested that the program be one of the large-scale long-term national economic planned developments. But the drawing up of the program has been unjustifiably prolonged. Today the five-year plan has envisioned assignments for reducing the application of manual labor that are not reinforced by material and technical support. Therefore the AUCCTU insists that the USSR Gosplan as the head organization accelerate the completion of the development of a comprehensive target program for reducing the application of manual labor under the 12th Five-Year Plan and Up to the Year 2000.

It seems that the designers of machines and equipment sometimes do not have a clear enough idea of the technical equipment the workers expect from them. The new equipment that is being produced on which they have to work frequently does not meet the requirements of safety or ergonomics and does not take into account the physiological peculiarities of the female organism.

During the course of sociological research conducted at a number of textile enterprises it was revealed that workers were complaining about unpleasant feelings associated with the imperfect design of the equipment. The research conducted by the All-Union Central Scientific Research Institute of Protection of Labor of the AUCCTU showed that significant design shortcomings that cause one to work in an uncomfortable position with arms stretched upward and the torso slanted at a more than 30-degree angle that are inherent in the textile and spinning-twisting machines of the T-150 and PK-114 ShChG and several other makes. There is a critical need for technical equipment for female machine operators which would have improvements that make it possible to reduce the level of noise and vibrations, the dust and gas content of the air, to improve temperature conditions, and also to reduce the amount of strength required to control tractors and combines.

Of course the creation of optimal sanitary-hygienic conditions for labor requires of many branches of industry additional expenditures related to the acquisition and installation of sanitary and technical devices and structures. But no provision of mechanisms and devices for enterprises will lead to the desired result without an essential change in technology. There is only one path: the determination of the optimal conditions that meet safety, technical and hygienic requirements in the stages of the creation of new technical equipment.

One cannot sidestep the problem of increasing the qualifications of women under modern conditions. It is especially critical today. It is no secret that in terms of the level of qualifications female workers on the whole lag behind their male counterparts, and in a number of cases the difference amounts to two to three categories. The scope of increasing qualifications of women does not correspond to their proportion among people employed in the

national economy: they comprise less than one-third of the overall number of people increasing their qualifications. Only a relatively small proportion of female workers are enlisted for training in occupations involving highly skilled labor--operators, adjusters of machine tools with numerical program control, mechanics for control and measurement instruments and equipment.

The main reason, it seems, is the lack of proper concern for the creation of necessary conditions for the professional growth of female personnel. The organization of production training of skilled personnel directly in production--and this is the main form of training of female workers--does not sufficiently take into account their capabilities and interests. One might ask how the situation stands with the privileges granted by legislation for women with small children to increase their qualifications? So far these privileges are being poorly utilized. The benefit envisioned by the decree of the CPSU Central Committee and the USSR Council of Ministers adopted in 1979 concerning measures for further improvement of training and increasing the skills of workers in production for women with children under 8 years of age is practically not utilized. They have been permitted to take training with leave from production and retain their average earnings. Training and increasing qualifications of workers returning to production after a long leave to care for their children is also organized unsatisfactorily.

#### Dual Employment--How To Help?

There is no doubt that the difficulties with the organization of training and increasing qualifications of women are largely objective: in the professional life of the majority of them there are inevitable interruptions related to birth and rearing of children. Moreover, because of the "dual employment," women have only two-fifths the amount of free time that men have. But still the main thing is overcoming the formulaic attitude of executives and trade union leaders at all levels--from the enterprises to the ministries and trade union central committees.

It is possible to combine labor in the public economy with concerns for the family when conditions for labor and recreation are favorable. But today in industry women frequently have to go on the night shifts. In RSFSR industry almost 20 percent of all the working women work on a three- and four-shift schedule, which includes night shifts. In the country as a whole 3.8 million women are employed on night shifts. Various people take various attitudes toward this fact, but in certain typical "female" branches the coefficient of shift work exceeds the analogous indicator in typically "male" ones. Here is the perspective: under the current five-year plan it is intended to release only 220,000 women from night shifts or 6 percent of those employed on night shifts. This figure undoubtedly cannot satisfy us and we shall achieve a considerable reduction of the number of women employed on night shifts and everywhere develop and introduce more adequate shift schedules at enterprises and in organizations.

We know of ways of increasing the social effectiveness of the labor of women and reducing their workload, especially those with small children. Normative documents permit us to apply schedules of incomplete and flexible working time. On 29 April 1986 the USSR State Committee for Labor and Social Problems

and the Secretariat of the AUCCTU approved the provisions coordinated with the USSR Gosplan concerning the policy and conditions for the application of the labor of women with children who work part-time and concerning their work at home. Unfortunately, the scope of application of these forms is microscopic. Today there are only 0.5 million women employed part-time in the national economy. About one-third are women with children under 10 years of age.

Many executives are afraid of the difficulties in the very procedure of establishing part-time work at an enterprise and the necessary additional organizational measures related to this. There is no doubt that anything like this requires effort. As the experience of a number of leading enterprises shows, especially in the Baltic republics, it is at least a shaky business to justify blocking part-time work by organizational and technical factors. An important role is assigned to trade unions which are obliged to assist the administration in selecting sections of production and work places and in organizing and staffing brigades for work under part-time conditions.

We should like for executives and trade union leaders, as it were, out of the goodness of their heart, conviction and economic calculation to engage seriously in the reduction of working time for women. But so far not very many changes have been observed and it is necessary to create a realistic legal obligation. It is not now mandatory for the administration to grant women the right to take advantage of privileged working conditions: if they want to they introduce these, if they do not--they refuse. Legislation should help women in these problems.

In the stage of experiment there is one more form of employment that is convenient for women--sliding (flexible) work schedules (SRV) which makes it possible for the workers to select convenient times for beginning and ending their shifts. The USSR State Committee for Labor and Social Problems and the AUCCTU on 6 June 1984 adopted a special decree concerning the policy and conditions for applying these schedules for women with children. But why mention the word "experiment"? Of course anyone who really desires to introduce SRV must conduct organizational preparation and be persistent. But it is not worthwhile to refer to difficulties. There is enough experience in our country as well as abroad. All we need do is take advantage of it efficiently and intelligently.

Further improvement in the employment of women in the national economy and increased social effectiveness of their labor can be achieved only with a comprehensive approach to solving production and social problems. Would you like to have an address to learn about our experience? Constant purposive concern for the creation of favorable conditions for working women is manifested by the administration and public organizations of the Vilnius Drill Plant, the Chayka Production Sewing Association, the Tallinn Production Sewing Association imeni V. Klementa, the Omsk Vostok Cotton Fabric Association of the Kavkaz Kolkhoz in Krasnodar Kray, and a number of other enterprises. They are creating good prerequisites for creative, inventive labor, cultural development and a health moral and psychological climate, and on the basis of this, they are achieving high economic results.



The emotional enthusiasm of an executive who is following his heart and improving the situation of female personnel can best be reinforced by the cold reason of science for then there is less probability that the enthusiasm will die out. We know of examples of this kind of enlistment of science in the form of the target program method.

These programs are coordinated with production plans, expenditures of funds and resources, the responsibility of specific workers, and their incentives and penalties. The addresses of enterprises with experience in applying the program approach contain the names of the cities Dnepropetrovsk, Novosibirsk, Tiraspol, and several others.

The course toward acceleration and intensification of production will reduce the need for labor force and in the future make it possible to reduce the length of the working time and further raise the level of education and qualifications. Soviet women are vitally interested in supporting the course toward acceleration. It corresponds completely to their aspirations.

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## CONSUMER GOODS PRODUCTION EXAMINED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 39-47

[Article by M. V. Kuleshov, chairman of the Central Committee of the Trade Union of Workers in the Timber, Pulp and Paper and Wood Processing Industry: "How the Branches Should Produce Consumer Goods"]

[Text] The theater experience, as we know, begins in the cloakroom. A hanger is only one of the "thousands of trivia" used at home that are produced as consumer goods. They are produced in the timber, wood-processing and pulp and paper industry. How are goods as necessary as these produced and what are their prospects?

Labor collectives of the timber industry produce more than 13 percent of the unionwide volume of goods for cultural and domestic purposes. During the years of the 11th Five-Year Plan they produced more than 8 million rubles' worth of these goods in excess of the plan. The comprehensive program for the development of the production of consumer goods and sphere of services during 1986-2000 sets for the USSR Ministry of the Timber, Wood Processing and Pulp and Paper Industry the task of increasing the output of products by 40 percent by 1990 as compared to 1985. Furniture, wallpaper, matches, skis, school notebooks and other items will be manufactured in the first year of the 12th Five-Year Plan in an amount in excess of 8 billion rubles, or 5.8 percent more than in 1985.

Ask any reader and he will be able to tell you which consumer goods produced by the branch are in short supply. First of all the demand is not being satisfied or is not being fully satisfied for individual kinds of furniture, paper napkins and toilet paper. Plans are not being fulfilled for the production of garden buildings and a number of other kinds of products, and their quality is poor. The causes of this lie both within the branch and outside it. Below I shall discuss how they are being eliminated or how they can be eliminated.

One of the problems has to do with the location of production. There are areas in the country where 80 rubles worth of furniture is produced per person. At the same time, in Western Siberia this indicator reaches only 25 rubles, and in Eastern Siberia even less--18 rubles. And there are convoys of

vehicles filled with furniture moving across the entire union from west to east and from north to south. Frequently the simplest wooden items for domestic use are shipped to cities and villages over hundreds and thousands of kilometers: handles for spades, hangers, nightstands, and clothespins whose production could easily be arranged at any local timber industry enterprise or timber farm. Therefore the trade union committees when developing competition for increasing the output of high-quality goods for the population are concentrating attention on making sure that each enterprise and timber industry business, regardless of its specialization and the nature of its basic activity, organizes its own manufacture of consumer goods and goods for domestic use, taking local demand into account.

Competition is only one of the levers. It is important to place consumer goods production on a cost-accounting basis. The appropriate experience has appeared in the branch. During the course of preparing for the 27th Party Congress the collective of the Novosibirskmebel Association began to work under the motto "For Effectiveness of the Utilization of Resources Through Cost-Accounting Relations." The guilty brigade is held responsible for failing to deliver parts under cooperation and for delivering poor-quality parts. Such is one of the steps in the formation of an economic approach to improving the production of consumer goods. In the middle of 1986 we considered the question of cooperative deliveries of facing panels to the Novosibirskmebel Association and also enterprises of Chita Oblast and Khabarovsk and Maritime Krays, which will make it possible to considerably increase the output of furniture in the eastern regions and reduce rail shipments of large items from the central and southern areas of the country.

On the whole, furniture comprises more than 80 percent of all the cultural and domestic goods produced by the ministry. Its production will have to be increased basically in keeping with the strategy of economic growth that has been adopted--at enterprises that are in operation, as a result of their technical reequipping and reconstruction. Trade union committees have found new methods for carrying out this task in addition to the traditional ones. Special attention was devoted to enlisting inventors and efficiency experts in the reconstruction. A valuable initiative was presented by councils of scientific and technical societies of the Moskva Furniture Production Association and a number of other enterprises that committed themselves to preparing ahead of scheduled the scientific-engineering support for the technical reconstruction and reequipping of production earmarked for the 12th Five-Year Plan. Certain organizational and economic conditions have been created for this. Thus, as a result of the concentration and specialization of enterprises that are being carried out in the branch, large labor collectives have been created. More than 75 percent of the furniture is produced by enterprises with a sales volume of no less than 15 million rubles a year.

Socialist competition according to the principle of the "worker relay" among associated enterprises that manufacture rough and finished blank pieces, parts and wooden slabs can contribute to the achievement of unity in the production of consumer goods. Collectives of enterprises with similar profiles compete among themselves. The competition between the Moscow Furniture Factory No 3 and the Gatchinskiy Furniture Combine is proceeding fairly well. The combine

has changed all piece-rate workers over to the brigade contract. The trade union committee of Factory No 3 became interested in the experience of the Gatchinskiy workers and after it was studied, 61 percent of the brigades were changed over to the contract under cost-accounting conditions. In turn, the Leningrad Obkom of the Trade Union helped the Gatchinskiy workers to borrow the experience of the Moscow workers for producing all products of high quality.

The production of goods made of paper and cardboard for cultural and domestic purposes and household use is important in the branch. As we know, so far the demand for wallpaper is not being satisfied and the consumers turn their back on it because of the colors and the quality of the drawings. Under the 12th Five-Year Plan it is intended to increase the output of wallpaper by 40 percent--as a result of better utilization of existing capacities and the introduction of new ones at the Bratsk Timber Industry Complex, the Moscow Voskhod Factory, Sakhalinbumprom, the Saratov Factory, and so forth. The Moscow, Leningrad and Tula wallpaper factories and the Saratov Wallpaper and Cardboard Factory have concluded an agreement for cooperation. It is directed toward rendering mutual assistance in the assimilation of production capacities and the utilization of advanced experience. The trade union central committee has supported the initiative and a challenge pennant of honor and a monetary reward have been established for the winners. The cooperation is directed toward a good cause--satisfaction of the consumer's needs through combined efforts.

The competition among associated workers within the branch provides an example of solving problems of interrelations and relations among various branches. So far, for example, many of our industries are producing light furniture which could come up to world standards. It could...all the achievements are lost because of the poor coloring of the upholstery materials that are supplied by the textile factories. It would be quite appropriate to extend the experience of the competition among the furniture workers to their interrelations with the textile workers.

There is now a great demand among the population for plastic skis which last 2-3 times longer than ordinary ones. The wood-processing combines are ready to come halfway and manufacture up to 1 million pair. Alas, their need for chemical materials is satisfied by only 30 percent. The Kotlassy and Syassk pulp and paper combines and the Kondrovobumprom Association are ready to produce the required sanitary and hygienic items today, but the Kursk Khimvolokno Association is not delivering enough polypropylene fiber. The furniture workers' demand for paints with ultraviolet drying, acid hardening and so forth is not being satisfied.

We are hoping for a change in the economic mechanism. After all, enterprises of the USSR Ministry of the Chemical Industry are among the first to change over to work according to the experience of AvtoVAZ and the Sumy Machine-Building Plant imeni M. V. Frunze. The chemical workers have an economic interest in the development of the production of consumer goods in our branch.

Since the goods are intended for popular consumption the producer must "go to the people." Industry can travel this road mainly through company stores.

The manufacturer is put in direct contact with the consumer, studies his demand, and correctly determines the assortment of products. Over more than a decade the Moscow company store "Furniture for the Kitchen" has become a shop for the enterprise and its workers, who are members of the factory labor collective, are joined together by a common trade union committee and actively influence the quality of the goods. The Tallinn House of Furniture has accumulated interesting experience. Here several times a year there are conferences of consumers who give good advice. In order to get people to participate they have organized a lottery in which they win inexpensive prizes paid for from the furniture factory's advertising funds: little tables, chairs, hangers. The consumers before acquiring the furniture can speak with a designer consultant who recommends how to place the furniture in the apartment most efficiently and draws a sketch.

The ministry now has about 20 company stores. Their network should be considerably expanded and stores should be introduced for selling wallpaper, garden buildings and other goods for gardeners as well as paper and paint items. Of course it is necessary to cooperate closely with local soviets of people's deputies. Thus one can form an extremely solid and reliable link between production and the consumer.

Today the entire country should be oriented toward the intensive path and the utilization of internal reserves. In our work this orientation is also becoming the law. Experience confirms its correctness. I shall again take the example of wallpaper. How does one improve its production through internal resources? The trade union central committee in conjunction with the ministry conducted at the wallpaper factory of the Tulabumprom Production Association branch competitions of brigades for producing wallpaper, in which the best brigades of 11 enterprises of the branch participated. The action contributed to accelerated dissemination of advanced experience. More competitions of this kind are now being prepared for brigades to display their professional mastery on the basis of the Koryunovskaya Factory for Industrial Paper in the Ukraine. Thus the winner gains a great deal from such competitions. The experience is also suitable for organizing work using new capacities, for example, for producing toilet paper and paper napkins at the Syktyvkar Timber Industry Complex, the Svetogorsk Pulp and Paper Combine, Sakhalinbumprom, and others.

Consumption is associated primarily with the concept of "quality." Consumers give well-earned respect to the products of Moscow furniture makers, the Vilnius, Druzhba and Ivanovomebel associations, Viysnurk Wood-Processing Combine, the Krasnaya Zvezda Match Factory and a number of others. But the demands of the consumers are increasing rapidly. Just a couple of years ago there was a shortage of everything and today there is a problem with sales, especially of costly furniture. And here is an internal reserve related, in particular, to competition. Special-purpose competition for the quality of consumer goods is effective in influencing the state of affairs in the All-Union Furniture Associations Tsentrmebel, Zapadmebel and Vostokmebel. At the Moscow Furniture Assembly Combine No 1 and the Kishinev Furniture Factory imeni M. V. Frunze 95-100 percent of the items produced are in the highest quality category, while in the branch as a whole this figure was 50.4 percent in 1985.



Quality requires material incentives. Therefore we have developed and put into effect provisions concerning bonuses for workers for the creation and organization of the production and manufacture of new commodities with improved quality. We have introduced incentives for the established assignments for producing consumer goods per 1 ruble of the wage fund and improvement of their quality. Scientific and technical support is also needed. It is no accident that 550 enterprises have adopted the initiative that originated in our plant for creating groups for engineering support of production brigades for purposes of above-plan output of commodities, increased labor productivity, release of products with the first presentation, and economy of raw and processed materials.

Among the most important internal reserves is economizing on material resources. Furniture workers of the South and Center of Russia and wood processors of Kiev during 4 years of the 11th Five-Year Plan with a minimum of financial and labor expenditures processed an additional 1.5 million cubic meters of wood raw material--wastes which were previously lost for good during selling and processing. Chipboard is manufactured from the wastes. Almost 2 million cubic meters of commercial timber are being saved, 25,000 railroad cars are being released, and the overall economic effect exceeds 30 million rubles.

Beginning in 1986 the ministry, the trade union central committee and the branch scientific and technical societies will be conducting a review of efficient utilization of timber resources of secondary timber raw material and wastes from timber procurements and wood processing. There are leaders here. Thus the brigade of machine tool operators of the Mukachevskiy Furniture Combine in the Ukraine headed by State Prize winner, member of the trade union central committee, V. M. Yantso, for several years has been working with waste-free technology to the credit of his personal account. As a result he receives 4 days a year for the materials that have been saved. There was a valuable initiative from the wood processors and furniture workers of Rastov Oblast concerning the participation of workers in the revision of norms for labor and material expenditures and the output of above-plan products using raw materials, processed materials and electric energy that had been saved. During 3 years of the 11th Five-Year Plan 500 brigades produced a savings of 1.27 billion rubles.

Nowadays everyone is thinking about acceleration. And not about a timid step, but a big leap. Can the branch take such leaps? I think that we have many reserves. Here is the example of the brigade of machine tool workers of the Moscow Furniture Assembly Combine No 2 which is headed by the deputy to the USSR Supreme Soviet, a member of the presidium of the trade union central committee, N. N. Merkulova. On the initiative of the collective, which participates actively in the reconstruction of production, the technology was changed for processing decorative elements of facing surfaces for office furniture. Labor productivity increased by a factor of 2.5 and 99 percent of the items are released with the first presentation. This is a real jump. I think that it is within the power of the branch as a whole. It is based on interest, the thoughts of the people, and that which is called the human factor.



The human factor has not yet been fully included in the solutions to socioeconomic problems in the branch. There is, on the one hand, the example of the Ivanovomabel Production Association where good working conditions have been created in the shops, the gas and dust content in the air have been reduced, the noise level has been reduced and the shops have all been provided with cloakrooms, washrooms and shower facilities. The medical engineering brigade is studying the reasons for illness, eliminating them, and implementing a comprehensive program entitled "Health." The shops have been brought into line with the requirements of technical activities, recreation zones have been equipped in them, they have rooms for psychological relaxation, and next to the dining rooms they have bar rooms and installations for preparing oxygen cocktails. One can also mention the Kishinev Factory.

Unfortunately, on the one hand, there are quite a few enterprises where not enough attention is being devoted to improving the conditions for labor and life. Although the plans for the construction of residential buildings on the whole are being fulfilled in the branch, additional possibilities of expanding construction of housing and social, cultural and domestic facilities are being poorly utilized. But yet this is also a reserve of the branch and the people employed in it.

The theater experience begins with the cloakroom. The production of consumer goods begins with man, in whom the most powerful resources exist. By taking advantage of them one can fully satisfy the demand for such goods.

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## SELF-MANAGEMENT CHANGES ECONOMIC MECHANISM

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 47-59

[Article by V. G Veretennikov, candidate of economic sciences, deputy chief of the division for wages and economic work of the AUCCTU: "The Economic Mechanism and Self-Management"]

[Text] The new conditions for management which were introduced first as an experiment and then encompassed a considerable number of ministries, on the whole have produced positive results: there has been a marked improvement in the fulfillment of the plan for deliveries under agreements, the growth rates of labor productivity have increased somewhat, and production costs have begun to decrease more rapidly. Additionally, collectives that are working well have been given great opportunities for material incentives for their workers and for solving social problems.

At the same time the changeover to new methods of management is proceeding with difficulty on both the methodological and the practical plane. While the overall evaluation of the new methods and elements of management that are being introduced is positive, one must recognize that they still are not providing for essential changes in the acceleration of economic growth, and the existing positive results are not of the nature of a qualitative change and their stability cannot be guaranteed. Moreover, as an analysis of the work of the branches that first began the experiment shows, their associations and enterprises achieved the highest results in 1984--the first year of the experiment. This pertains primarily to providing for deliveries of products under agreements and reducing expenditures per ruble of output. Moreover, such ministries as the Ministry of the Electrical Equipment Industry, the Ministry of Heavy Machine Building and also the Ukrainian SSR Ministry of the Food Industry have even worsened their work indicators. In this connection one cannot but agree with the conclusions of a number of economists that the improvement of indicators that was achieved during the first year of work according to the new method is explained by the fact that they utilized mainly organizational factors of growth and primarily discipline was strengthened (delivery discipline, technological discipline and labor discipline). But in order to develop the success it is necessary to put permanent, deep reserves to work, which are based on improvement of production itself and technical reequipping of it. And this was not done in the majority of enterprises.

At the same time it seems that the main reason for the still-inadequate influence of the new methods of management on the acceleration of the rates of our growth consists in that we have not taken over to the proper degree a radical element in the restructuring of management--the human factor. The economic normatives that have been introduced do not strongly stimulate the initiative of the workers, their highly productive labor or high quality of work. At a whole number of enterprises not only many workers but frequently specialists and managers of sections and shops as well have an extremely foggy idea of the essence of the new methods of management.

According to data of a sociological investigation conducted by the Scientific Center of the AUCCTU at 20 enterprises that had been included in the large-scale experiment as early as 1984, only 40 percent of the 3,000 workers who were questioned had heard anything about the experiment, and in general they had a poor idea of what it meant. Only 16 percent had obtained certain information about it in courses for political enlightenment and economic education. Only 6.4 percent of the workers and 4.5 percent of the engineering and technical personnel and employees participated even in making a decision regarding such a question as the utilization of the material incentive fund and the fund for social and cultural measures. Hence both the inability and the lack of desire to take on responsibility for solving crucial problems and the excessive caution in the utilization of the rights that had been granted them.

Perhaps it is not necessary to inform each individual of the conditions of the experiment for the enterprise as a whole? Perhaps it is sufficient to divide them up among those collectives the results of whose activity are comprehensible to the worker, for example, for brigades? But even in the brigades a large proportion of the workers do not know the indicators for which the collective is given earnings and bonuses and they do not know or they have only an approximate idea of what to expect with successful or unsuccessful fulfillment of the assignments. And in industry as a whole, according to data of selective investigations, the assignments for increasing labor productivity (reducing production costs) are relayed to only 45 percent of the brigades, and assignments concerning material expenditures--to 16 percent of them. Every third brigade receives no annual assignments at all, even for work volumes.

The large-scale experiment and collective forms of organization and stimulation of labor are two of the most important areas which must merge and, in the final analysis, form a new economic mechanism for management which is based on increased independence, expansion of rights and greater responsibility of labor collectives for the results of their activity. Will the goal of improvement be achieved if those it affects are not even properly informed about the conditions and their rights and responsibilities? Sometimes formalism is given as the reason, but this does not explain anything or rectify anything. Apparently the problem is that up to now, with the implementation of various economic innovations man himself has not been taken into account sufficiently--the worker, specialist, or manager of the lower, middle or even higher level. And these innovations are carried out according to the usual bureaucratic procedures. In spite of the fact that practice has

again and again shown the groundlessness of such procedures, people place their hopes in the paper containing a decree as in a tank that is sent to break through the redoubts of the outdated mechanism. And they have little thought about the crew of the "tank"....

With the glaring shortage of information about the changeover to the new conditions of management it seems to many people that it is necessary and sufficient for success simply to develop explanatory work and education. There is no doubt that this stage in the establishment of the new mechanism is necessary. But it would be wrong to consider it sufficient, and this has been well-noted in places where the information work has been done. After this it is necessary to check on the direct participation of the workers in the management of production and the solutions to problems related to the economic and social development of the associations and enterprises. The new methods of management create favorable conditions and possibilities of this. But it would be wrong to assume that these possibilities are automatically transformed into reality. They are only prerequisites for the realization of this kind of participation. At the present time the trade unions are working actively to provide for the direct participation of the labor collectives in the formation and discussion of drafts of plans for economic and social development. Last year, for example, the interesting experience of economic and trade union organizations of the Prikarpatles Association in enlisting workers in the development and implementation of plans for economic and social development was generalized and disseminated. It became a rule in collectives of the association: the drafts of the plans are to be developed from below--from the collectives of brigades, production sections and shops. This made it possible to develop a mass search for production reserves, acceleration of scientific and technical rearmament, and solutions to social problems of development.

Unfortunately, this did not become the practice everywhere. Drafts of plans at many enterprises are developed as they were before by a narrow group of people, and at best all that is left for the collective is to approve the socialist commitments that have been drawn up by this method.

Many managers of enterprises are inclined to explain the inadequate activity of the labor collectives in planning their economic and social development by the lack of documents that regulate their participation in this work. In particular, they point out to the failure on the part of the USSR Gosplan to fulfill the decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1985 regarding the creation of interbranch methodological guidelines concerning the policy and time periods for the development of plans for the economic and social development of production associations (enterprises) under the new conditions of management. The 3-month period established for this by the decree expired long ago but there is still no document that would reinforce the technology of planning or the policy and time periods for forming the draft of the plan and discussing it in the labor collectives.

Explanatory work is necessary in order to familiarize, train, interest and motivate workers. And to do this the provisions of the new mechanism must correspond to their interests so the actions of one worker for the sake of his



own interests are simultaneously directed toward satisfying public interests. Unfortunately, frequently this requirement is not met. When conducting the Leningrad Experiment among designers and technologists, the sums of the wage fund of release specialists were kept and not distributed among those who remained. It is clear that these kinds of actions do not contribute to working with fewer personnel.

It is known that the individual piece-rate form of payment for labor does not always contribute to increasing productivity. The reason is that if one worker or a group of workers considerably exceed the output norm, a disproportion arises. The norm center begins to "cut" the estimates. In a brigade that is paid according to the final result it would seem that one could refrain from this practice and not take into account the fulfillment of the output norms by former piece-rate workers. But this kind of accounting still remains. The managers are afraid that greed will break out and earnings will increase excessively. But the workers do not need "super earnings" as much as a guarantee that if they make additional efforts and achieve an additional result their earnings will increase correspondingly according to a long-term normative. This guarantee has nothing to do with greed, on the contrary, it is fully coordinated with the socialist principle of distribution according to labor, its quantity and quality.

These figures were presented at the 10th Plenum of the AUCCTU (1986): bonuses for economizing on resources are like an April Fool's joke and amount to 1-2 rubles per worker per month. Can one really speak about any real interest in economizing? The "caution" with the incentives was explained by the fact that they had not created a well-arranged system of norm setting for releasing the resources or accounting for materials that had been saved. This was indeed the case, but I would call this a secondary cause. Obviously there is no well-arranged system because nobody is interested in it.

The Politburo of the CPSU Central Committee in June 1986 approved proposals concerning changing over to complete cost accounting at associations and enterprises of the Ministry of Chemical and Petroleum Machine Building and a number of enterprises of other industrial ministries following the experience of the Sumy Machine-Building Plant imeni M. V. Frunze and AvtoVAZ. The key features of the experience are self-financing of industrial and social development and an essential reduction of the number of indicators set for the enterprise by planning assignments as well as the introduction of stable economic normatives for the distribution of profit and the formation of the economic incentive fund.

And here we come up against a long-established problem of deepening intraproduction cost accounting. The measures that have been taken so far for improving the economic mechanism have generally not affected relations among enterprises, associations and their structural subdivisions. In practice, the mechanism for intraplant management has not changed for the latter. To put it more simply--their labor collectives lose nothing when the indicators of their work deteriorate and they gain nothing when they improve.

The consequences of scientific and technical progress are equally ambivalent from the standpoint of influence on the individual worker. How is it



reflected in man--does it evoke positive emotions or is it painful, how does it attract people to itself and draw them into its orbit? Under the current five-year plan, for example, it is intended to put more than 120,000 robots into production. Even if one takes into account that one robot replaces the labor of 1.5 workers (which is extremely low) it turns out that 180,000 workers will have to be retrained in order to send them to other work places. Here it is necessary to be concerned about making sure that not a single worker loses earnings and that the conditions for his labor do not deteriorate. Then the attitude of the workers toward the intended technical reequipping of production will be favorable.

The science of labor is called upon to answer these and a number of other questions raised during the course of improvement of the economic mechanism. It has fairly high authority, including abroad. It has close ties with practice and many recommendations of scientists that are reflected in the decrees of the party, government, the USSR State Committee for Labor and Social Problems and the AUCCTU are based on a translation of production experience. There is no doubt that the experience of the leading enterprises is very significant. But where are the methods of the Scientific Research Institute of Labor, the Institute of Economics of the USSR Academy of Sciences and the Institute of Sociological Research of the USSR Academy of Sciences? Behind the broad cover of production practice it is easy to write monographs and defend dissertations. Incidentally, when people recommend adopting the experience of others there always arises the objection: We have our own specific features. The generalized method of a scientific research institute is another thing: it could be typical and universal and take into account all specific peculiarities.

Or take the certification of work places. Incidentally this was not suggested by science either, but from below, by the collective of the Dnepropetrovsk Combine Plant imeni K. Ye. Voroshilov. The initiative was supported by the CPSU Central Committee and the directive agencies adopted a decree. But what about science? As always, it was limited to methodological recommendations without going into the depths of certification. Therefore it is no accident that we come up against cases of a formulaic approach. Investigations show that after certification notes are prepared that the workplaces are suitable. And if replacements are needed it is only for one or two. This approach leads to strange situations. For example, at one of the enterprises in Perm a rolling mill installed last century, when there were extremely difficult working conditions, was declared to be suitable for further operation with an evaluation close to the maximum. In an outburst of candor the Perm workers explained: the machine builders needed an initiative in order to obtain additional money. Without the "initiative" nobody will allot this money! What do they use to replace machine tools when they are outdated, obsolete and worn out?

It seems that science should figure out how to interest people in real certification, how to coordinate this with improvement of the economic mechanism as a whole, how to redistribute the labor force released as a result of the certification, and so forth.

Interbranch requirements and normative materials concerning scientific organization of labor have been in effect in our country since 1977. These are supposed to be taken into account when planning new and reconstructing existing enterprises as well as developing technological processes and equipment. Formulated in them are clear instructions for planners, designers and technologists which make it incumbent upon them to take the requirements of scientific organization of labor into account in their developments. But these are followed poorly. According to data from research, more than half of the new developments do not meet the sanitation norms and if one takes into account the requirements of scientific organization of labor and its collective forms, very few developments fulfill the requirements of this document. Scientific and technical progress is frequently embodied in implements, means of labor and technology that are alien to modern requirements. There are cases when newly created technical equipment does not improve but even worsens working conditions, which elicits justified complaints from the workers. These complaints applied to a number of enterprises of the Ministry of Tractor and Agricultural Machine Building, the Ministry of Machine Building for Animal Husbandry and Fodder Production and the Ministry of Machine Building for Light and the Food Industry.

In this connection I should like to recall that beginning in 1986 the country prohibits the production of machines and equipment whose operation involves monotonous labor and also labor in conditions that are dangerous, difficult or harmful to human health without equipping them with means of mechanization and automation. Trade union central committees and the technical inspection team for labor should strictly enforce this prohibition and provide for unconditional observance of standards of labor safety both by planning and design organizations and by manufacturing plants. But instead of strictly fulfilling the aforementioned documents, having preliminarily analyzed why they have ended up in oblivion, we have grasped onto another kind of experience--the Dnepropetrovsk experience. And yet it is obvious that the replacement is inadequate: the instructions are preventive; the human factor must be taken into account before the building is constructed, the machine is put into operation, the technology has been introduced and the certification has already been arranged using an analysis of the equipment already in operation, when it is much more difficult to change things if it is possible at all.

The initiative of the Zaporozhye workers directed toward eliminating manual labor has been deservedly supported. The experience is based on scientific approaches, particularly the target program approach. The results are impressive. There are also followers. But this initiative arose, in my opinion, because here too science had not coped with a critical problem--the lack of interest in raising the level of mechanization of production and labor. Otherwise the Zaporozhye initiative would not have been needed at all. But even it, unless it is combined with the new economic mechanism, is awaited by the sad destiny of many other undertakings from below.

Today scientific and technical progress is proceeding along the path of the creation of highly productive but costly equipment. Its effectiveness depends largely on the load. The task is clear: to increase the shift work of equipment. This task has been around for a long time but it is resolved

poorly. Why? In the first place, the low coefficient of shift work is brought about by the fact that the number of workplaces is greater than the number of workers. Another reason is linked to human psychology and customs. People prefer to rest together, in more comfortable and favorable periods of the day when, incidentally, the labor output is also higher. In addition to everything else, recently a number of decrees have been adopted which permit the application of part-time work and a sliding schedule, which cannot but contradict (all other conditions being equal) the need to increase the coefficient of shift work. How does one take into account requirements of a social nature? Can science provide a fundamental, well-substantiated answer to this question?

"The shadow of total catastrophe." This is how many bourgeois sociologists today characterize the consequences of the scientific and technical revolution. Railing against science and technology, they do not see or do not wish to see that the causes of the disasters they are considering are not technical but social in nature and that they are rooted in the capitalist system of management. Today in the United States alone 10 million people have ended up "outside the gates" and in the Common Market countries--14.6 million. The social problems of introducing labor-saving equipment and technology are resolved simply--at the expense of mass layoffs of workers.

Such a solution is precluded in a socialist society. But we will have to introduce technologies and productions that involve few or no people as well as automated shops and plants. Therefore the task of planned placement of workers released under the influence of technical progress is exceptionally important and will be even more so the further we proceed. A study conducted at a number of enterprises shows that the approaches to solving this problem are far from identical. For example, at the Moscow Krasnyy Proletariy Production Association one-third of the workers for the newly introduced facility for producing robot equipment were machine tool workers who had been discharged and retrained. At the same time at the Taganrog Combine Plant the restructuring of production was not accompanied by a well-thought-out system of retraining and replacement of workers. As a result, 1,200 workers were discharged from one plant and neither the administration nor the trade union committee has any idea what happened to them.

The growing scale of the discharge of workers under the influence of scientific and technical progress (already about 7.5 million are being released and in the future--1.5-1.7 million people a year) requires prompt information about the scale of the discharge of workers and a concrete determination of the possibilities of placing them in new jobs and organizations for retraining.

All this should be envisioned in the plans for economic and social development. Special attention should be given to the retraining of elderly and less educated workers. This problem is not critical today (one is more aware of the shortage of skilled workers). But with the increasing scale of the introduction of new technical equipment and the acceleration of the rates of elimination of manual labor it will become more critical and it is necessary to prepare for this.

The problem of finding jobs for people who have been discharged because of technical progress must be solved in such a way that they experience neither economic nor social harm and their qualifications and earnings are not reduced. In methodological recommendations concerning the reduction of turnover and stabilization of personnel are not enough to do this. They were suitable in a particular stage of the development of our economy. Now, it seems to us that the least one can say is that they do not contribute to development and it is more likely that they retard it.

The economic mechanism will be improved the more effectively and rapidly the more we take into account the reserves that lie in self-management. This interconnection was discussed convincingly at the 27th CPSU Congress. But self-management cannot be reduced simply to elections of brigade leaders, shop chiefs and even directors of enterprises. It involves the direct participation of labor collectives in solving all complex problems of their economic and social development. In his speech at the conference of the aktiv of the Khabarovsk Kray Party Organization on 31 July 1986 M. S. Gorbachev emphasized that "today everywhere we must actually provide for the participation of the people in the solutions to city, oblast and kray problems as well as problems of the society as a whole."

With respect to production self-management it is necessary to meet at least two extremely important requirements. First, actually to enable the labor collective to take advantage of the right granted to them by the law concerning labor collectives to make decisions regarding a wide range of issues in economic and social development. And, second, to bear complete (economic and moral) responsibility for the results of the economic decisions made by the collective.

Under the new conditions of management these constituent parts are most fully represented in the principles of self-supporting production and self-financing that have been tested by collectives of the AvtoVAZ Production Association and the Sumy Scientific Production Association imeni M. V. Frunze. This year enterprises of a number of other ministries and departments have changed over to these conditions for operation.

But what is the situation with respect to self-management? Let us look at some plant provisions concerning the brigade, the brigade leader, the brigade council and the council of brigade leaders. There we will see this entry: "The brigade leader is elected by a general meeting of the brigade and is approved by the foreman or a manager acting for him." Another one: "The brigade leader is under the jurisdiction of the foreman or the manager acting for him." My observations have shown that nobody finds anything special in these entries. But think about them: if a brigade leader is elected then he is approved by the ones who elected him. What good is the foreman here? Even the director? And the brigade leader is under the jurisdiction not of the brigade, but of the foreman. It might seem strange but for some reason nobody notices any difference between election and appointment. It turns out that the brigade has been given the right to elect leaders, but then this right was immediately taken away....



The collective form of organization and stimulation of labor potentially contains prerequisites and conditions for the development of self-management and the participation of each worker in it, but these are little used and they are used far from always. The coefficient of labor participation, for example, is a potentially powerful instrument of democratic distribution of earnings precisely in keeping with the individual contribution to the overall result. But in practice its possible effectiveness is "cut away." In the first place, for a long time it was permitted to distribute according to the coefficient of labor participation only that part of the earnings that was in excess of the wage rate. Subsequently a broad interpretation prevailed and today restrictions have been officially removed. In the second place, the minimum amount of earnings of the brigade member was determined by the wage rate or salary, although there is a minimum of 70 rubles established by the state in keeping with the USSR Constitution. In the third place, the range of the coefficient of labor participation, for example from 0.5 to 1.5, was established from above. But how can this be if the contribution of the workers varies not by a factor of 3 but by a factor of 5? In the fourth place, the coefficient of labor participation is frequently "determined" by the foreman. What kind of self-management is this?

Problems similar to the ones mentioned can be found in planned provisions concerning literally every point. But the main thing is that when adopting any decrees, provisions or solutions economic and trade union workers have asked themselves: do these instructions leave anyplace for direct democracy or self-management? Self-management which does not undermine the principles of one-man management but, on the contrary, strengthens them but at the same time provides for protection of the interests of the collective as a whole and the state?

The production managers shrug their shoulders in confusion: "If the brigade leader is not under the jurisdiction of the foreman there will inevitably be anarchy. Even today it is difficult to give an order to a worker, but what will happen if this point is written into the provisions?" Obviously, they will suffer losses of their own authority. But in response to their misgivings one can say: It is time to change the style of management and stop giving orders to each worker individually; it is necessary to work with the collective according to the agreement of the contract which has stipulated the interrelations beforehand. When the collective is given the opportunity for self-management there will be fewer occasions when it is necessary to intervene in its activity, the tasks of the manager will be facilitated and he will gain time for creative work. For example, why complicate the procedure for documenting leaves with the permission of the administration? Let this be a leave "with the permission of the collective," who know more about who to release and when and who are aware of their responsibility for the plan and for education.

Questions of self-management should undergo deeper development during the testing of the new mechanism for management and during the drawing up of provisions concerning counterplanning and the introduction of the collective contract. As a separate subject this is being studied during the development of decisions regarding councils of trade union committees. We are well aware of the general principles but there are not enough well-substantiated



methodological recommendations and instructions which are so needed in practice. After all, practice is not always ready to suggest something itself, and one cannot demand of practice something that one cannot do oneself.

In conclusion I wish to discuss the positive experience that was studied by our division in May 1986 in the Georgian SSR. I am speaking about the practical participation of labor collectives in making decisions regarding personnel problems. In the republic ministry of the timber, pulp and paper and wood-processing industry a number of positions of managers of lower-level managers (brigade leader, foreman, senior foreman) are being filled according to the results of elections in the labor collective by open voting. In the Tbilisi Gantiadi Furniture Production Association the brigade form (it encompasses 92.6 percent of the workers and 70 percent of the workers in cost accounting brigades) contributed to an appreciable savings on raw and processed materials. At the Tbilpribor Plant the candidacy of a brigade leader is discussed by the council of brigade leaders of the plant in addition to the meeting of the brigade. Chiefs of shops and divisions, and the director and his deputies are appointed by a decree of the board, but their candidacy is discussed beforehand and they are accepted at meetings (conferences) of the labor collectives. At the demand of the collective in the Poti Seaport the chief of the port was relieved of his duties and a candidate was suggested to replace him. At the Gantiadi Association they conducted an experiment that has become common in the republic: for 2 weeks promising young specialists worked in all the responsible positions. Soon, by a decision of the collective, 8 of the 24 participants were promoted to higher posts. The practice of advancing managers on preliminary recommendations from the labor collective is being applied most extensively in the republic. Thus at the Poti Gidromekhanizatsiya Plant the deputy head engineer was promoted to the position of the sewing factory and the head engineer was promoted to the position of director of the Elektroapparat Plant. In these actions we see real steps in the fulfillment of the decisions of the 27th Party Congress concerning democratization of management. It will be necessary, however, to do much more and this cannot be individual islands of experience, but an entire flotilla of practice that is being led forward by science.

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## PROCEDURES FOR TAKING ADVANTAGE OF RIGHTS DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 60-67

[Article by S. I. Shkurko, doctor of economic sciences, director of the Scientific Center of the AUCCTU: "We Have the Rights! How Do We Take Advantage of Them?"]

[Text] The labor collective is increasingly coming to the fore in the economic and political systems of our society. Its advancement to leading positions is based on the development of property relations, changes in the economic mechanism, expansion of independence of associations, enterprises and organizations, and their increased responsibility for the results of their activity. It seems to us useful to consider the legal aspect of the democratization of the management processes.

It is natural to begin a discussion of the USSR Law on Labor Collectives and its increased role in the management of enterprises, institutions and organizations. The law has established very extensive authority for the collectives. Legal experts count more than 100 examples of authority that embrace the most important spheres of the vital activity of labor collectives: management of production, improvement of conditions for labor and life, and ideological-educational work.

Labor collectives in the local areas do not remain indifferent to this authority and are taking advantage of it to a certain degree. Nor is the AUCCTU standing aside. It has created a working group for questions of the participation of trade unions in the implementation of the law. It is considering the practice of work for realizing the authority of labor collectives, shortcomings and advanced experience. If one is to be frank, however, one must admit that the utilization of the law leaves a good deal to be desired.

For example, the status of the general meeting of the labor collective has risen significantly. Its decisions, which are adopted in keeping with its competence and legislation that is in effect, are mandatory for members of the collective and administration. Consequently, in the meetings one can see features of the state administrative agency. True, this is potential. Actually the situation is different. Mass inspections, including an analysis

at 38 enterprises conducted by the AUCCTU Scientific Center, showed that the meetings have not yet taken their proper place in the realization of the authority of the labor collectives. In the majority of cases their agendas contained traditional issues that had also been discussed previously: 73.5 percent--the adoption and discussion of the fulfillment of collective agreements; only 4 percent--improvement of labor organization; 3 percent--the dissemination of advanced experience; 2 percent--improvement of social-domestic conditions and educational work; 1 percent--distribution of the economic incentive fund. The structure is not conducive to realizing the authority of the labor collective.

Another example. According to the law, questions for discussion at general meetings are brought up on the initiative of party, trade union and other public organizations in conjunction with the administration, and also by individual members of the collective. According to data from the research, 61 percent of the questions were brought up jointly by the trade union and the administration. Neither the standing production conference nor the people's control agencies or any other public agencies raised any issues. On the whole they corroborate the evaluation given by the 27th Party Congress: "The law on labor collectives has undoubtedly contributed to enlivening their initiative. But we still cannot say that it is producing the results we had counted on. The conclusion is simple. It is necessary to radically improve the mechanism which would make it possible to transform the democratic principles and norms contained in the law into the practice of daily work."

Consequently it is necessary to have an efficient and reliable mechanism for realizing the authority of the labor collectives. But first a couple of words about its organizational-legal aspect. The rights and responsibilities of the collective have been formulated: participation in the development and discussion of the drafts of plans; the implementation of measures for their fulfillment; the cooperation of the administration during the course of their fulfillment; the handling of the issue of the responsibility of individuals who do not fulfill the collective agreement; the introduction of suggestions for more complete utilization of internal reserves; the application of social incentives for success in labor; contribution to mass technical creativity, and so forth. The law does not indicate the specific content of the actions presupposed by these and other kinds of authority, and that is not its purpose. It creates a legal basis for the organization of the collective's activity. Hence the task--to reveal the concrete content of the authority and inform the collective of this, keeping its specific features in mind.

For detailed regulation of the authority of the labor collective it is necessary to answer four questions: What is the content of the authority, who exercises it, what means are required and applied for this, and what are the legal norms and guarantees that provide for its realization? The answers to these questions are not simple. In this area science has diverged from the demands of practice and there is very little practical experience. The enterprises are excessively cautious, especially in cases when they come up against things that are known to be unclear in the relationship between the norms of the law and other norms. The trade unions are not displaying the proper activity.

One cannot do without trade unions, the administration and the collectives themselves here. Here are a couple of questions regarding Article 11 of the Law which interprets the approval by the labor collective of proposals concerning improvement of the system of bonuses for workers financed from the material incentive fund. The first question: What is this approval? Apparently it is the collective's sanctioning of proposals, say, concerning bonuses prepared by someone, say, in the administration in conjunction with the trade union committee and other public agencies. In other words, approval is the same as agreement: if they agree it can be approved, if they do not agree it has to be worked on.

The second question: In this case who is the labor collective and who actually realizes this authority? The general meeting? Hardly, it has more important issues. The trade union committee, other public agencies, authorized representatives of the collective between general meetings, the administration? These questions pertain to two other articles of the Law--the 6th and 7th. Yet there are many more articles like this. For approving proposals concerning bonuses I would recommend a lower level of representation of the collective, for example, an expanded meeting of the trade union committee. We are speaking about the distribution of material goods and control on the part of the trade union is completely appropriate.

The third question: In what form should the approval by the labor collective of proposals for bonuses take place? Apparently in the form of a decision of an expanded meeting of the trade union committee which is made by an open voice of those participating (not only by members of the trade union committee) and not only by a simple majority, but by a predetermined necessary majority of the votes.

The fourth question: How is this approval legally guaranteed? Perhaps a policy should be established whereby the trade union committee is authorized to halt actions of the administration if they contain violations of proposals that have been made concerning bonuses?

And so for each article of the law and for each kind of authority it is necessary to answer all four questions. Who could prepare answers to such questions in the form of recommendations? It is understandable why they should be recommendations: regarding many issues it is necessary to have answers with many variants which are intended for the diversity of specific collectives. It would probably be expedient to create under the AUCCTU Scientific Center a council consisting of representatives of science (institutes of law, Soviet legislation, labor and so forth) and practice (trade union committees, other public agencies and the administration). The recommendations of the council would be received on a democratic basis: after a "trial run" with public opinion and the voting of the members of the council.

The council, relying on the rich experience of participation of workers in management, could also suggest the necessary corrections to regulations, provisions and other normative documents that are oriented toward realizing the authority of the labor collective. It should be noted that so far the mechanism for realization of this authority has not been actively developed



and it has seemed that there has been no need to make changes in the legislation. Today it is obvious that such changes are simply required. Recommendations of the council could become an essential addition to the USSR Law on Labor Collectives.

Now about the economic aspect of the matter. Regardless of what authorities may be declared and guaranteed, the collective will not take advantage of them unless it is economically and socially interested in them. I have in mind primarily the existing economic mechanism and measures for improving them. We need forms and methods of management that materially motivate each worker to achieve high final results, which would attract all participants in production to develop, adopt and fulfill management decisions. In other words, the organizational-legal mechanism for the legalization of authority should be reinforced by or even based on the economic mechanism.

In keeping with party instructions the enterprises must be changed over to true cost accounting, self-supporting production and self-financing. The level of income should be made directly dependent on the effectiveness of the work. It would seem that there is every reason to think that the mechanism for realizing the authority of the labor collectives is working at full force. Alas, this assumption is not yet justified, which is shown by the results of a questionnaire conducted by the AUCCTU Scientific Center at 20 enterprises that have been operating for a year and a half under the conditions of the large-scale experiment.

More than one-fourth (27.5 percent) of the workers who were investigated (a total of about 4,000) had not participated in realizing a single important kind of authority envisioned by the law. Of those questioned 10.8 percent of the workers and 22.4 percent of the engineering and technical personnel and employees have participated in the development and discussion of plans for economic and social development. It would seem that nobody could remain indifferent to the distribution of economic incentive funds. But only 6.4 percent of the workers and 5.4 percent of the engineering and technical personnel and employees participated in this. The picture looks no better with respect to other kinds of authority.

In this connection I shall discuss three issues.

First, it has historically developed that improvement of the economic mechanism proceeds "from above." This kind of descending influence is quite possible but it would be worthwhile to turn more frequently to the opinion of those affected by the changes. The top managers of enterprises are still somehow drawn into making important economic decisions and the labor collectives remain on the sidelines. According to the data of the already mentioned investigation, 33 percent of the workers have actually avoided evaluating the large-scale economic experiment, saying that in a year and a half it is still too early to judge, 26.8 percent mentioned the need for further deepening of the principles, and 37.8 percent were in favor of more persistence in conducting it. The effect would be different if the workers had been drawn into the discussion and evaluation of the conditions of the experiment 2 years earlier. It is not surprising that no serious improvement in the attitude toward labor was noted.

Second, when developing the economic mechanism it is necessary to clearly underscore those economic spheres where the collective will exercise its authority and envision a complex of measures for this. Otherwise the authority will never be utilized. Thus Article 14 of the Law assigns to labor collectives participation in the development and approval of estimates of expenditures of the fund for the development of production. It was pointed out that at the 27th Party Congress that the money from this fund must be earned. Once the collective has earned this fund it should also dispose of it. But how does this situation look? In the first quarter of 1986 the estimated expenditures from the fund for the development of production were approved at far from all of the enterprises. In keeping with these estimates, as usual, centralized capital investments were financed but no measures were taken for technical improvement.

In Articles 8, 9 and 10 the law gives labor collectives the authority to establish benefits and privileges financed from the material incentive fund and to determine workers eligible for these privileges. The forms of benefits and privileges, their amounts, the conditions and the policy for payment (granting) are also the prerogative of the labor collective, which should be reflected in the corresponding section of the economic mechanism. But it has not been reflected. The old formulations are found in the provisions concerning the formation of the material incentive fund.

At the 27th CPSU Congress they discussed the need to expand the range of issues concerning which public agencies, including trade unions, could override the decisions of state management agencies. It would be expedient to include here everything that impedes the realization of the authority of the labor collectives.

Third, practice has shown the need to improve the economic mechanism on the macro- and microlevel in such a way as to affect the interests of each worker. The shortcomings of many large-scale measures for improving planning and economic incentives are explained largely by the fact that they do not encompass all units of the production process. The brigade form of organization and stimulation of labor affected only the lowest levels of production management. Everything else continues to operate in the same old way. The party congress pointed out that it would be useful to extend these forms to sections, shops, services and entire enterprises. It will be necessary to use new methods to evaluate the work of structural subdivisions and distribute earnings within them and among them in keeping with the labor contribution. It is necessary for each participant in production to be interested not only in the results of his own group, but also in the final results of the entire enterprise.

So far there are only a couple of dozen enterprises that have taken this approach. But even in them one can see the features of what is new in the development of democratic principles of production management. Enterprises and their structural subdivisions have more extensive rights in the utilization of the funds earned by the collective. The social activity of the labor collectives is increasing and there is a new range of economic and social problems regarding which the labor collectives and the administration

are making mutual commitments. These issues can considerably enrich the content of collective agreements. The role and position of the brigade in the system of deepening self-management is changing. It would be expedient to consider this aspect at an interdepartmental council for the development and increased effectiveness of the brigade form of organization and stimulation of labor.

The managerial aspect of the realization of the authority of the collective has been developing intensively since the party congress. We are speaking about the creation of an agency for democratic self-management--the council of the labor collective. What should it be like? Obviously, the council should not replace the general meeting as the most authoritative agency of the collective, which retains the right to consider and make decisions regarding the most important and fundamental issues, which has already been discussed in this article. The following criterion is suggested for dividing up the areas of competence of the council in the meeting: everything pertaining to the enterprise as a whole and the strategy for its development is a matter for the meeting, and things that pertain to particular issues, individual subdivisions and groups of workers, and current planning and activity are matters for the council. Of course, in addition to independent decisions the councils of labor collectives will preliminarily consider materials brought up at the general meeting, supervise their implementation, inform the labor collectives about this, and so forth.

The council, like the meeting, must make final management decisions within its own realm of confidence for otherwise it will end up in a position of the standing production conference. Some people expressed the fear that the rights of the trade unions will be restricted. One must say that this fear is groundless. Of the more than 100 kinds of authority, many of them, as it were, belong to nobody and the trade unions could take advantage of them. It is another matter that the trade union committee should be more responsible for preparing issues for consideration by the meeting in the council and increase their activity in performing the inherently trade union functions in the self-management agencies.

In conclusion I wish to discuss a key prerequisite in realizing the authority of labor collectives--informing the workers. Here is the way the issue stands: Without information there is no possibility of actually influencing the vital activity of the collective or managing the enterprise. Sometimes the information level is not very high. I refer once again to the data from the aforementioned research. After a year and a half of working under the conditions of the experiment, almost half of the workers questioned stated that they had heard about it but did not have a good understanding of what it meant. Even when it came to how the material incentive fund is formed only every fifth person had a good idea of this, two-fifths had an approximate idea and 17.8 percent did not know about it at all, thinking the experiment had nothing to do with them. The low level of information is the result of the random nature of the knowledge of the workers. The main sources of information are newspapers, the radio, speeches of managers of enterprises and discussions among comrades. Only every seventh person questioned had received information through courses for political education and economic training, perceived as one of the reliable channels for knowledge and information.

It is necessary to introduce at the enterprises a system of information support for the realization of the authority of the labor collectives. It is also necessary to have been economic training, which was discussed at the 10th AUCCTU Plenum. The trade unions have the broadest possibilities of carrying out this task and a ramified network for training and increasing the qualifications of trade union personnel and the aktiv. It would also be expedient to create a system for training workers and employees in key issues related to the vital activity of the labor collectives that reflect the most important state decisions concerning improvement of the economic mechanism. It would be possible on the basis of the AUCCTU Scientific Center and the AUCCTU Pavilion at the Exhibition of the Achievements of the USSR National Economy to organize special classes for the trade union aktiv and the staffs of trade union councils which would advance this knowledge. At enterprises it would be possible to transform schools of communist labor for these purposes. One must say that the proposals are finding support among the trade union councils.

The labor collectives are participating in making decisions not only regarding intraproduction issues, but also state issues. But this is another important area for realizing their authority, one which requires special consideration.

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## WORKERS TO RECEIVE LEGAL ADVICE

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 68-74

[Article by L. M. Konnov, discussion leader of the legal division of the AUCCTU: "Rendering Legal Assistance to Workers"]

[Text] The trade unions are organizing and rendering free legal assistance to workers concerning protection of labor, housing and other rights. In the legal consultations of the trade union councils alone more than 2 million workers, kolkhoz workers, employees and pensioners (there are more than 500,000 of them hired individually) receive assistance in solving legal problems each year. Legal assistance to workers is also provided by public legal consultation agencies that are operating under the trade unions of enterprises, construction projects and sovkhoses. There are more than 36,000 of these.

The trade union legal consultation services are not limited to explaining legislation that is in effect. If necessary they contribute to eliminating violations of the law, resolving conflicts and publicizing Soviet legislation.

In 1985, at the request of trade union agencies, 315 managers of various ranks were relieved from their positions because of violating labor legislation and commitments under collective agreements as well as for bureaucratism and red tape.

At the Perm Experimental Mechanics Plant, acting on signals from its workers, they revealed serious violations of labor legislation and planning and production discipline. During just a half year in the shops more than 1,500 hours were worked each month on days off and overtime without the agreement of the trade union committee. The administration regularly failed to pay the additional wages to the workers and employees for this overtime work. The fine that was imposed on the plant's former director Yakhnin did not serve as a lesson to him. Instead of admitting and correcting the violations, the director began to settle accounts with those who had "hung out the dirty laundry." It is not known how long the activity" of the angry director would have continued if the presidium of the obkom of the trade union of workers in construction and the construction materials industry, having resolutely come to the defense of the interests of the plant workers, had not put an end to

it. In spite of attempts on the part of the higher organization to bend the law for the violator, at the demand of the trade union obkom he was fired from the position he held.

Of course it is necessary to punish evil. But it is important to make sure that each worker has a firm knowledge and has no doubt about the fact that the law is mandatory for everyone, and social justice is not an abstract term, but our daily life.

But in life certain trade union committees, instead of demanding that the administration observe labor legislation, take a conciliatory position, they put up with violations and sometimes they even commit them themselves. The reason for this is not only legal illiteracy, but also a desire not to damage relations with the administration. Trade union committee chairmen come and go but the director remains--such a psychology still exists among trade union workers.

To be sure, labor legislation for purposes of unimpeded activity by trade union committees offers additional guarantees to chairmen and members of trade union committees who have been relieved of their basic work: the administration does not have a right either to transfer them to other work or to discipline them or to discharge them without the consent of the trade union committee or higher trade union agency. These guarantees extend to them only during the period for which they are elected, and after that the former trade union committee chairman becomes an ordinary worker who is no longer protected from the management for his disobedience during the time he was in office. Obviously, the law has not sufficiently taken this psychological factor into account. In Bulgaria, for example, the guarantees granted to elected workers apply to them for a year after the period of their authority has expired. Of course, such a solution is not a panacea against unprincipled behavior and the lack of desire to perform their duty honorably on the part of certain trade union workers, but this experience is undoubtedly worthy of attention.

The law has granted Soviet trade unions extensive rights and opportunities, which they are called upon to realize in the interests of the workers in various areas of social life, but mainly in production and in the sphere of labor. When bringing up the personal, collective and general interests of the workers before state and economic agencies the trade unions are obligated to defend and protect them. This pertains primarily to conditions for labor and wages and the application of legislation concerning labor. In a number of cases state and economic agencies have a right to take actions only with the agreement of the trade unions. A failure on the part of the administration to observe this policy invalidates its acts concerning the establishment of new conditions for labor, the use of overtime work and work on days off, the firing of workers and employees on the initiative of the administration, and so forth.

In our day the role of trade unions in guaranteeing the observance and protection of the rights and interests of the workers is increasing. The 27th CPSU Congress recognized the need to expand the range of issues which state (economic) agencies can resolve with the participation or the preliminary agreement of trade unions right down to granting the latter the

right, in a number of cases, to halt the implementation of management decisions. The congress also pointed out the serious shortcomings of the trade unions in the matter of protecting the rights and interests of the workers and directed them toward more purposive and persistent work for realizing the principles of social justice and social legality in the area of labor.

In keeping with Article 96 of the Fundamentals of Labor Legislation, the trade unions provide supervision and monitoring of the observance of labor legislation. Practically all units--from the trade union committee to the AUCCTU--participate in this work. A special position here is occupied by the legal and technical inspection teams for labor, which have been given the authority to enforce their decisions.

In the system of trade unions there are more than 7,000 legal and technical inspectors for labor who rely in their work on an army of many thousands of supernumerary inspectors for labor and the trade union aktiv. Each year they check on the observance of labor legislation and rules for the protection of labor at hundreds of thousands of enterprises. Yet the only specialized trade union agency for supervision and monitoring of the observance of labor legislation is the legal inspection team for labor, whose activity began in 1977 on the basis of provisions concerning it that were approved by the Presidium of the AUCCTU on 22 November 1976. These provisions have been in effect in a new edition since 23 August 1985.

In 1985 alone legal inspectors checked on the condition of legality and labor relations at more than 76,000 enterprises. From the results of the inspections they issued more than 19,000 prescriptions that are mandatory for the administration which contained more than 140,000 demands to eliminate violations. As a result, the labor rights were restored to many thousands of workers and employees.

The legal inspection teams, which are staffed by highly qualified legal experts, can eliminate legal violations on the spot and also take the guilty officials to court. In 1985 at the insistence of inspectors about 6,000 officials were disciplined, more than 3,000 managers were fined, and more than 3,000 illegally fired workers and employees returned to their jobs.

Recently the duties of the legal inspection team have also included checking for observance of housing legislation. In 1985 this was organized at 14,000 enterprises of various branches of the national economy. As a result, they revealed the grossest violations in the setting up of accounts for citizens and the distribution of housing, especially at enterprises of construction, agriculture, rail transportation and so forth, for which 418 executives and trade union leaders were held responsible and 62 of them were fired.

The figures that have presented show the scope of the work done by the legal inspection teams. But this should not be exaggerated. The number of violations of labor legislation is decreasing extremely slowly. One of the reasons is the inadequately effective work on the part of all legal protection agencies, including the inspection teams.

In recent years the courts alone annually satisfy about half of the suits for restoring jobs, wages, and other violations of labor rights, that is, these are those cases where the trade unions have been obligated to protect the workers whose rights have been violated.

According to data from legal statistics, in 1985 the courts forced payment of 2.3 million rubles in wages to people who had been returned to their jobs for the time they had been forced to be absent, while the guilty officials had to pay only about 400,000 rubles, that is, 17 percent. These figures show that the trade unions still do not always provide for reliable protection of the workers from the arbitrary actions of individual officials. Sometimes they only register facts of violations but do not hold the guilty parties responsible. Certain causes of violations are repeated from year to year. It is necessary to increase the effectiveness of the work of the legal inspection teams and persistently make sure that attention is drawn to each violation and that not a single guilty official avoids his just responsibility.

We need new forms and methods of work. We are already searching for them. In order to increase efficiency a number of legal inspection teams are working in close contact with judicial agencies and procurators' agencies. Thus in the Chuvash ASSR with the agreement of the oblast trade union committee and agencies of justice, all material concerning clearly illegal firings of workers and employees are sent to the legal inspection team, bypassing the consideration of the issue in court. In 3-5 days the legal inspectors return the illegally fired person to his previous job and make sure that reimbursement is made for damage caused to the enterprise at the expense of the guilty officials.

On the initiative of the AUCCTU in conjunction with the USSR procurator's office in 1986 a letter was prepared and sent which makes it incumbent on procurator's agencies to file suits to move people who have received housing illegally; it is prescribed that legal violations that are discovered be reported to those enterprises where they took place.

Soviet trade unions have various forms and means of protecting the interests of workers that are inherent only in our system. They have been granted the right not only to monitor the observance of labor legislation, but also to participate directly in legislation work. Trade unions in the form of the AUCCTU and the republic trade union councils participate actively in the preparation and adoption of legal and other normative documents concerning labor. The USSR Constitution grants them the right to legislative initiative.

In practice not a single law or other legal act that involves the labor rights and interests of the workers and employees is adopted without the participation of trade unions. The USSR Law Concerning Labor Collectives (1985) was developed with their direct participation. The AUCCTU in conjunction with state agencies has prepared a number of normative documents that are directed toward further improvement of well-being as well as improvement of conditions for labor and life. These include the new rules for reimbursement for harm caused to workers and employees because of labor injuries (1984) and the instructions concerning the policy for their application (1985). As compared to previous legislation the rules have



essentially improved the material position of people who have suffered in production. Their right to reimbursement for harm has now become guaranteed. With the participation of the AUCCTU they prepared a number of other legal acts that expand the labor rights of women with small children.

The legal service is participating actively in the overall work for changing the style and methods of operation of the trade unions. Stronger measures are being taken for supervising and monitoring the observance of legality in the sphere of labor and the level of preventive work for preventing violations of the rights of workers is rising.

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## IMPACT OF LABOR DISPUTES DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 72-73

[Article by V. I. Zheludkov, sector chief of the legal division of the AUCCTU: "Examination of Labor Disputes"]

[Text] One of the forms of ensuring legality in the labor relations of workers and employees is the participation of trade unions in the examination of labor disputes that arise at enterprises. Each enterprise has a commission for labor disputes. It is formed from an equal number of permanent representatives of the trade union committee and the administration. Any worker has a right to appeal to this agency if he thinks that his labor rights have been violated. The commission is obligated to consider his statement and make an appropriate decision.

The next level of authority in resolving labor disputes is the trade union committee. It is granted the right to resolve essentially a dispute which has not been resolved in the commission for labor disputes and also to supervise the legality of the decisions that are made in the commission. Having heard the worker involved and the representatives of the administration in having considered the proof they have offered, the trade union committee by an open vote adopts a decree regarding the labor dispute.

In practice in the majority of cases the decisions of the commissions and the decrees of the trade union committees regarding labor disputes are implemented voluntarily by the administration. If for some reason this has not happened the system of compulsory implementation goes into effect. In this case the trade union committee takes advantage of the right that has been granted to it to issue a special certificate which is submitted to a legal executor for implementation. In other words, the decision of the trade union committee is backed not only by authority of the trade unions but also by the authority of state enforcement.

And if the worker does not agree with the decree of the trade union committee he has a right to file suit in the people's court. The administration can also go to court if it thinks that the decree of the trade union committee contradicts existing legislation. Thus the court is the third and last level of authority that can resolve disputes between workers and the administration.

The majority of disagreements that arise are resolved in the labor collectives. In 1985, for example, less than 4 percent of the labor disputes were examined in judicial agencies.

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## WORKERS PARTICIPATE IN MANAGEMENT

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 74-78

[Article by A. A. Nemontov, general director of the Vladimir Tekhnika Production Association, deputy chairman of the USSR Supreme Soviet, and Ye. S. Yevlikov, doctor of historical sciences, professor, head of the department of scientific communism of the State Pedagogical Institute imeni P. I. Lebedev-Polyanskiy (Vladimir): "Direct Participation in Management"]

[Text] There is perhaps no manager today who would deny the need for management activity on the part of the workers. But official recognition does not always mean readiness in reality to contribute to the management activity of the workers. The results of sociological research conducted at various enterprises of the country, including in Vladimir and the oblast, show that from 17 to 24 percent of the managers prefer the executive activity of the workers. What factors are impeding more effective functioning and development of the management activity of the workers?

Let us begin with the fact that on the scale of the country there is not a single center (agency) that can coordinate the work of all management activity of workers, analyze the crucial problems in the development of public management agencies, generalize and disseminate the experience of their activity, prepare recommendations, and reveal the general tendencies in the development of this complicated and sometimes contradictory phenomenon. In other words it is necessary to bring the organizational structure of the public management units in line with the changing socioeconomic and political tasks of the country and the style of economic management.

This is the kind of disparity that is observed today. Agencies of the PDPS [standing production conference] are under the direct jurisdiction of the AUCCTU and the local trade union organizations, and the public bureau for economic analysis, technical norm setting and technical information and several others are under the jurisdiction of the USSR VSNTS [All-Union Council of Scientific and Technical Societies] and its local agencies, and the councils of innovators, public patent bureaus, public design bureaus and so forth are under the jurisdiction of the USSR VOIR [All-Union Society of Inventors and Efficiency Experts] and its local agencies, and public personnel divisions compete with the corresponding services of plant administration. If



in addition to this one takes into account the fact that in the modern industrial enterprises there are dozens of these and other public management agencies one can clearly see the need for coordinating their practical work. The lack of coordination in their activity leads to parallelism, duplication, and dispersion of the creative forces and the capabilities of the participants, of whom there is an entire army.

The formation of an All-Union Council for Public Management Agencies of the USSR, and in local areas (republics, krais, oblasts, cities, rayons, associations, enterprises, shops)--councils of public management agencies of the corresponding region or collective (Footnote 1) would make it possible to radically improve the work of public management agencies, increase their effectiveness, raise the theoretical level of interpretation of the process and prospects for their development and increase the prestige of the activity.

On the scale of the country such an agency could be formed on the basis of the corresponding organizations of the VOIR and VSNTU USSR. There is no need for new ones. What has been said certainly does not mean that this is the only path. On the contrary, there can be other variants. Another thing is important: to recognize the need to improve the existing structure of public control agencies--the most important subsystem for the management of public production. This will make it possible to gather the management activity of the workers under one "roof" and to join forces in solving the most important production, sociopolitical and moral problems.

Naturally, it will logically be necessary to develop a set of unified unionwide provisions concerning public management agencies of the USSR. So far such provisions have been developed on a statewide only for the PDPS. All the other public management agencies use the provisions and recommendations either of the AUCCTU or those developed directly in the labor collectives. They do not have the force of law and they are very uneven in terms of content and form of presentation. In a number of cases they do not stipulate the legal status and so forth.

A more organic combination of the mechanism of state and public agencies for managing production will contribute to increasing the effectiveness of the participation of workers in production management. Today assistance and leadership on the part of divisions and services of the enterprise (associations) are mostly voluntary. This kind of leadership should be made normative. To do this it is necessary to augment the provisions concerning divisions and services for planned management with the corresponding points that make it incumbent upon their leaders to render the necessary assistance and provide overall guidance of the work of various public management agencies, determining above all the most promising areas for their work. (Footnote 2)

The publication of the specialized journal OBNCHESTVENNYYE ORGANY UPRAVLENIYA V SSSR will begin soon. At present the publication of both theoretical and practical materials on this subject is episodic. Moreover, since they are dispersed among the most diverse journals, they do not and cannot produce an integrated picture of the overall state of affairs with respect to the participation of workers in the management of production. (Footnote 3)

Even such a journal as REFERATIVNYY SBORNIK-67. ORGANIZATSIYA UPRAVLENIYA does not devote a special section to "Participation of Workers in the Management of Production" or "Public Management Agencies." There is no such section in the international journal PROBLEMS OF THEORY AND PRACTICE OF MANAGEMENT either.

For the sake of objectivity let us note that for a number of years SOTSIALISTICHESKOYE SOREVNOVANIYE has been publishing a few articles on the problem under consideration. But the volume and the regularity of the publication and, the main thing, its purpose do not make it possible for the editorial staff to constantly generalize and disseminate the experience in management activity of the workers.

Management, even if it is independent, also requires skilled, competent, purposive and systematic leadership. Hence it is expedient to form, for example, in divisions for scientific organization of labor and management, a sector for the participation of workers in production management (analogous to what is being done in the sphere of competition), which would officially take responsibility for permanent leadership of the entire system of management activity of the workers.

Management activity must be studied. We need special schools, training programs, training aids, methodological developments and so forth. Otherwise the appeals and the desires to enlist workers in management of production, not to mention increasing its effectiveness and the quality of this work, remain, as frequently they already remain, only empty wishes.

Today in the sphere of public production there is an overall total of up to 1 million public management agencies in whose work more than 10 million workers from the sphere of production participate. Just from participants in the PDPS, whose number is about 6 million, there are more than 1.5 million proposals concerning improvement of production and working conditions, which could produce an economic effect of up to 7 million rubles. Let us add that the participation of workers in the management of production is a most important sociopolitical and moral factor for the onward movement toward communist public self-management.

Increasing the effectiveness of management activity of the workers, like any other activity, depends to no small degree on the system of material and moral incentives. It is paradoxical but true that when material and moral stimuli are extended to leading workers, production innovators and participants in socialist competition they actually do not affect those who in public management agencies not only make an invaluable contribution to the overall cause of advancing the economy, but also provide examples of a communist attitude toward labor and demonstrate an active position in life.

The time has come to extend socialist competition to other public management agencies as well. It could be, for example, competition for the title "Best Standing Production Conference," "Best Public Bureau for Technical Norm Setting," "Best Council of Innovators"--these are all within the enterprise or association, and among enterprises and associations there could be the "Best

General Plant Standing Production Conference," "Best Public Bureau of Technical Norm Setting" and so forth. We are speaking not about reviews or competitions that are conducted episodically at enterprises, but about a systematically organized competition among agencies for public management of enterprise following the basic parameters that reflect the specific nature of their work.

We have made these suggestions repeatedly and frequently have met with misunderstanding. Today when at the 27th Party Congress they have discussed the formation of councils of labor collectives and the AUCCTU has come out in favor of closer coordination of the activity of state and public agencies for management, we hope that these proposals will find a positive response.

#### FOOTNOTES

1. The Group for Sociological Research of the Vladimir Pedagogical Institute as an experiment at a number of enterprises of the oblast, particularly in the Vladimir Tekhnika Production Association, created a council of public agencies for management of the association which were given the task of coordinating the efforts of creative associations and generalizing the experience of their work for production management.
2. A number of enterprises of the country have experience like this, particularly the Saranska Elektropyryamitel Plant. See: Scientific Organization of Plant Management. A Collection of Provisions Concerning the Functioning of Divisions of the Enterprise That Reflect the Requirements of the Provisions Concerning the Rights of the FZMK, the PDPS, the Commissions of the Trade Union Committee, the Regulations of Scientific and Technical Societies of the USSR, the VOIR and the Provisions Concerning Creative Associations of Workers Participating in Production Management. Saransk, 1975.
3. The official statistical collections like NARODNOYE KHOZYAYSTVO SSSR, MY I PLANETA, and so forth do not have a permanent section for "Participation of USSR Workers in Production Management" either for the country as a whole or for the various republics, regions and oblasts. A numerical material that is appearing in various kinds of reference publications is of a formal nature and cannot serve as a basis of in-depth and systematic analysis of various processes in the management activity of the workers.

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## IMPORTANCE OF WORKER SAFETY STRESSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 79-84

[Article by A. P. Semenev, chief of the division for protection of labor of the AUCCTU, head technical inspector for labor of the AUCCTU: "A Matter of Primary Importance"]

[Text] During the years of the 11th Five-Year Plan significant measures were implemented for creating healthful and safe working conditions. Each year allocations for these purposes increased. In 1985 they had increased as compared to 1980 from 2.4 billion rubles to 2.8 billion rubles or by 17 percent. State allocations for special clothing, special footwear and means of individual protection during this same period increased from 2 billion to 2.9 billion rubles, or by 45 percent.

Recently the country has created a system of safety standards for labor as a basis for the creation of safe equipment. This has made it possible to influence technical equipment and technology more effectively in the stage of planning, design developments and the output of experimental batches and experimental models.

All the complicated and multipurpose work conducted by economic and trade union agencies has contributed to reducing production injuries in the national economy. As compared to 1980 the level had dropped in 1985 by 20.3 percent; occupational diseases had dropped by 19.5 percent. Working conditions were improved for 15 million workers.

Each year more than 70 enterprises, organizations and institutions in the country work without accidents. There are such enterprises in various branches of the national economy, including the coal, chemical and timber industry and so forth, which are the ones with the greatest danger of injury.

Unfortunately, one must admit that the condition of the protection of labor at many enterprises and in various branches of the national economy cannot be called satisfactory. There are both accidents and emergencies, and the people suffer and considerable material damage is done to the state.



In May 1985 in Moscow there was an All-Union Conference on the Protection of Labor. The conference developed recommendations and as the first point of these recommendations it was written that the Main Directions for Preventing Production Industry and Occupational Diseases is daily introduction of a comprehensive system of control of the protection of labor.

What were the main points of the system of control of the protection of labor? This system presupposes a clear definition of the functions and duties for observing conditions and protecting labor by each worker from the brigade leader and foreman to the manager of the enterprise. On the scale of the ministry this system envisions a determination of the functions and duties and also the responsibility for the condition of the protection of labor of all functional administrations and branch managers. That is the first thing. Second, it envisions a systematic analysis of working conditions and the degree of safety of equipment and technological processes and, on the basis of this, planning of both current and long-range measures. Third, the system envisions moral and material incentives for labor collectives for the achievement of high indicators of the condition of labor protection or, conversely, a reduction of bonuses for management and engineering and technical personnel who have allowed these conditions to deteriorate. Special indicators are also established for these purposes.

The introduction of a system for control of the protection of labor at the Saratov Nitron Production Association, the Severodonetsk Azot Production Association, the Moscow Automotive Plant imeni I. A. Likhachev, the Pervomayskiy Kolkhoz in Kostroma Oblast, the Kolkhoz imeni Michurin in Odessa Oblast and a number of others convincingly show its effectiveness.

Control of the protection of labor has already stepped outside the gates of the enterprise and is beginning to encompass entire branches. For example, the USSR Ministry of the Automotive Industry has developed and is beginning to introduce a branch system for control of the protection of labor which provides a comprehensive approach to the insurance of safety, the protection of health and the creation of optimal conditions for effective and high-quality labor for all production associations, enterprises and organizations.

Thus the system for control of the protection of labor envisions first of all a changeover from random measures to planned and purposive work. As early as 1986-1987 it will be necessary to determine in each branch and region the base enterprises for the introduction of the system of control of the protection of labor and to conduct training and examination of the knowledge in this area of management and engineering-technical personnel. It will be necessary to accelerate the development and introduction of branch and regional systems for control of the protection of labor following the experience of the USSR Ministry of the Petroleum Industry, the USSR Ministry of the Gas Industry, the USSR Ministry of the Automotive Industry, the Chuvash ASSR and Lvov Oblast. And, of course, even now one must think about creating automated systems for the control of the protection of labor, equipping them with modern monitoring-measurement and information apparatus. They make it possible to monitor the conditions for labor automatically in response to the necessary control commands.

All this is impossible without systematically raising the level of knowledge of questions of the protection of labor on the part of engineering and technical personnel and the workers themselves. Unfortunately there are frequent cases where the violation of norms and rules for the protection of labor, accidents and industrial injuries take place simply because of inadequate knowledge on the part of service personnel.

It was suggested as early as 1986 to create in each kray and oblast people's universities for the protection of labor. Training in the People's University for the Protection of Labor follows a 2-year program without leave from production. Its students are chairmen and members of commissions for the protection of labor of trade union committees, supernumerary and technical inspectors of labor from trade unions, public inspectors for the protection of labor, and engineering and technical personnel of services and divisions of enterprises and organizations. Unfortunately, such universities have not been created everywhere.

Scientific and technical progress should lie at the basis of the improvement of conditions and protection of labor in production. New machines, technical equipment and technology should reduce the labor-intensiveness, increase the productivity of labor and improve the sanitary and hygienic conditions. Unfortunately, this does not always happen. There are still numerous examples in which the designers, concerned mainly about such parameters of machines and technological processes as speed, reduction of weight and increased volume of output, forget about the fact that people will be working with these machines and that the effectiveness of the new technical equipment and technology will depend largely on the conditions in which they are working.

A clear-cut methodological base is necessary for the creation of safe and reliable technical equipment and technology. With the active participation of trade unions the country has developed a system of safety standards for labor (SSBT). At the present time more than 390 state and more than 600 branch standards are in effect, and establish the basic safety requirements for machines and equipment.

The introduction of SSBT standards has had a positive effect on the technical equipment that is created. During the years of the 11th Five-Year Plan alone more than 17,000 models of new types of machines, equipment, devices, instruments, and means of automation were created, and then make it possible to eliminate manual labor completely as well as the probability of injury to people. These are machines and mechanisms, machine tools and equipment for various purposes, combines and tractors, extraction equipment for coal and ore deposits, and also mechanisms that provide for complete safety in procuring and processing trees and timber.

Thus there is a basis and fairly good one. Now the task is to make sure that all the equipment that has been created and put into mass production completely meets the norms for the protection of labor and the ergonomic requirements of the "man-machine" system. To these ends it is necessary to increase the role and responsibility of engineers for protection of labor in planning and scientific research institutes as well as the role of groups of experts. The center of gravity lies in experimental verification of the work

of the machine for technologies directly in production. It is precisely here that one finds the mistakes which could have been rectified before series production was started.

At the present time at enterprises and in organizations and departments there are more than 100,000 engineers for the protection of labor and safety techniques. Unfortunately, there are still many serious shortcomings in the work of this large army.

First of all, the staffing of services for the protection of labor with specialists with higher education does not extend to personnel. Practically everywhere engineers for labor protection and safety techniques are given work that is not part of their jobs. Their wage level is lower than for operations workers in production. Engineers for the protection of labor and safety techniques are included among administrative and management personnel and are the first to go when there are cuts. Certain ministries and departments are not fulfilling the decree of the AUCCTU and the USSR State Committee for Labor and Social Problems concerning the organization of an independent section for the protection of labor directly under the jurisdiction of the minister or one of his deputies. Up to this point these divisions are included in various administrations.

Obviously, we need measures for assigning highly qualified experienced specialists to the services for the protection of labor in the staff of ministries, departments, enterprises and organizations. It is necessary to support these services in all ways, to render assistance and, naturally, to increase the demands made on them so that at work more pure conditions will be created which preclude industrial injury and occupational illness.

Like any large problem, improvement of conditions for the protection of labor cannot take place without extensive enlistment of scientific research organizations. When speaking about the tasks and directions for the development of science in the area under consideration one should have a clear idea of the basic tendencies of scientific and technical progress and the prospects for the development of branches of the national economy. Which of these tendencies interest us from the standpoint of labor safety?

The branches that provide for acceleration of scientific and technical progress in all of public production will develop at very rapid rates and there will be an increase in the proportion of machine building, electric energy engineering and the chemical and petroleum industry. In machine building the rates of automation of production will increase. Automation, however, does not always improve the labor of workers. Instead of heavy physical labor there frequently appears a less difficult labor for controlling mechanisms. The strain on the nerves increases because of the high level of responsibility for the correctness of decisions that are made and the large volume of processed information and the strict rhythm that is imposed on production. Designers, physiologists and labor psychologists must think seriously about making sure that technical equipment and technology of the future corresponds to the physiological capabilities of the human organism.

Sets of equipment with large unit capacities will be utilized more and more extensively and the production of industrial robots and new kinds of lifting-transport and loading-unloading as well as warehouse equipment will increase. In this connection there will probably be an increase in the influence of such physical factors as vibration, noise, and the gas and dust content in the air.

Further electrification of the country sets new tasks that are brought about by the creation of installations with ultrahigh voltage. There are still problems related to the application of atomic reactors with large capacities. The protection of labor is faced with a complex of issues concerning ensuring radiation safety, electricity safety, hygiene and physiology of labor, and effective forms of protection from electromagnetic fields with ultrahigh voltage and also protection of the environment.

There will also be further development of such technologies as electron-ray, laser, plasma-mechanical and dust coating. The ensurance of safety in the utilization of these processes requires comprehensive research in the area of labor hygiene, beginning with norm setting for production factors since the workers will be in conditions that have not yet been sufficiently studied.

New problems are arising for the protection of labor in connection with the creation of fully automated and robotized productions that do not involve man's participation. Since there will be no workers there is a question of the expediency of expenditures on ventilation, safety equipment, lighting and so forth. For brief supervision of the operation of the mechanism it is suggested that individual means of protection be used. The question is fairly complicated. On the one hand, there is a considerable savings of money, and on the one hand there is the need for fairly frequent presence of people. If in automated processes that are operating well when performing operations of a single type almost 20 percent of the working time is used for adjustment and repair, with multi-operational processes these jobs take up considerably more time. This is something to think about.

The most important direction for cooperation between scientists and engineers, technologists and designers is the creation of the enterprise of the future which should provide not only "qualitatively new technological processes and higher labor productivity and not only safe, but also comfortable working conditions in the full sense of this word."

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## HUMAN FACTOR ACCOUNTED FOR IN PLANNING

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 85-95

[Article by A. V. Kormilkin, consultant of the division for wages and economic work of the AUCCTU: "Concern for Man--On a Planned Basis"]

[Text] Because of the nature of my work I frequently have occasions to visit enterprises and meet with executives and trade union leaders. With respect to the social development of labor collectives they can be fairly clearly divided into two categories: some understand its significance and are doing something about it while others are at best indifferent to social planning.

In the first category I would include Vladimir Fedorovich Veres, general director of the Prikarpatles Association, a passionate person, I would say devoted to his work and very sensitive and caring when it comes to a specific worker, his needs and his requirements. This association was written about in EKO (1984, No 10). It is renowned for its production achievements, but even more, in my opinion, in the social sphere. At all of its enterprises I noted an attitude toward social aspects that was no less interested and serious than the attitude toward production, economic and technical aspects.

I asked Vladimir Fedorovich how he managed to achieve such an about-face. "We were aware," he answered, "that it is impossible to demand better production results from people without at the same time increasing concern for them. But in order for this concern to be manifested not from time to time but constantly, we came to the need to place it on a planned basis, that is, planning social development. Thus he explains the essential need for scientific-substantiation of control of the human factor in production--social planning. This comes from an executive who is supporting his words with deeds.

Unfortunately, one still encounters fairly frequently executives who cannot see the trees (people) for the forest (technical equipment, technology). In those enterprises both the labor turnover is high and the discipline is weak and also there is nothing especially worthy of praise in production affairs. Such executives, even if it is from the opposite side of the fence, also support the logic of V. F. Veres when he says: "Why social planning; who needs it?" Indeed, if the human factor is ignored there is no need for means of controlling it.

Many people remember well the time when control of the social sphere at the enterprise, including planning, lagged significantly behind other work. Questions related to housing, food, children's preschool institutions, the creation of favorable conditions for work, the elimination of heavy, unskilled jobs, increased qualifications, improvement of the health of the workers, organization of their leisure and education were almost neglected. At a certain stage life forced us to turn and face these problems.

It is remarkable that the initiative came from below. The first plans for social development were drawn up in Leningrad, in the Svetlana Association, at the Elektroapparat Plant and a number of other enterprises. Lvov and Perm workers followed them. Incidentally, the names of the pioneers are well-known. A good deal of time would pass before the social sections became an official indispensable part of the plans for economic and social development. Until that time social planning would be a manifestation of the initiative of the labor collectives of tens of thousands of enterprises, organizations and institutions and would spread far beyond the country.

The start of the undertaking, which was weak at first, was supported mainly by trade unions. They participated in the strengthening and expansion of the movement and in its scientific and methodological support. This kind of support is required even today. Actually, this role of the trade unions was no accident. Their tasks consists precisely in solving social problems, an instrument of which was the planning of social development.

A fairly large number of works have been written about this instrument. There is no point in repeating what is known; it is more useful to analyze new requirements on social planning which have arisen in connection with the new course earmarked by the party.

Let us take the question of expanding the democratic basis for the development of self-management. There is the USSR Law on Labor Collectives and there are decisions that insistently demand the development of direct democracy in production. But let us drop into the "kitchen," where the plans for social development are being drawn up. There we will see executives and specialists and, as a rule, no matter how many we see we will not see any to whom the plans pertain or who will have to carry them out. The object of planning has not yet become its subject.

There are exceptions of a positive kind. When the plan was being drawn up for the social development of the collective of the Leningrad Optical-Mechanics Association for the 12th Five-Year Plan, several thousand workers, engineering and technical and employees participated. The participation was reflected in the issuance of specific proposals, which were taken into account in the planning document. The association had mastered a simple truth: In order for the worker to receive the plan as his own vital affair he must participate directly in its formulation. If one follows the logic further, it is necessary also to register specific individual prospects for each person. So far individual social planning is being developed methodically and the first results are being applied at a small number of enterprises.

The development of self-management is moving in the direction of increasing the rights of ever smaller and lower-level collectives--shops, sections and brigades. The planning of social development must keep up with this movement. It would be expedient to determine the prospects for the development of all of these collectives in keeping with the plan. Up to this point one encounters more frequently objections to the form of the question: "Where will the brigade get the funds?"

In the first place, these are funds of the collective of the enterprise, and, in the second place, a brigade with cost accounting is itself in charge of a certain sum of resources which can be expended in a more planned way.

It is necessary to take a new approach to traditional sections of the plan for social development. For a beginning let us take working conditions. There is no doubt that we have taken a step forward in this sphere. During 1981-1985 along we spent more than 10 billion rubles on measures envisioned by plans and collective agreements and working conditions were improved for more than 20 million people. The USSR is correctly included among the countries with the lowest level of industrial injury. But, as before, more than half of the funds allotted go for compensation for unfavorable consequences of working conditions. Many managers are satisfied with this approach because they do not have to worry about harmless and safe technical equipment and technology.

Nor can one forget about the sharp change in the people's attitude toward working conditions. More and more frequently at enterprises I see young people who do not like the conditions which were considered acceptable in the recent past. According to data from research, 15 years ago 70 percent of those questioned would agree to any amount of additional work if the earnings were increased. Today if the work is unattractive it will be accepted by only 30 percent. Yet the branches and enterprises when planning technical progress are still frequently oriented toward semi-automated equipment and conveyor labor, that is, those types of labor which the workers do not like.

When reading the plans for social development one never ceases to be impressed by the figure that reflects how difficult it is to solve one of the most crucial social problems--the elimination of heavy manual and unskilled labor. As a rule, the number of people employed in this kind of labor is to decrease by 2.5 percentage points. These rates, which are sufficient for the first half of the next century clear show that the existence of this kind of labor is not perceived as a problem.

Yet--and this was discussed at the 27th Party Congress--the planned approach to the elimination of heavy, unskilled labor on the basis of passportization and streamlining of work positions is producing appreciable results. In Zaporozhye Oblast, for example, during the news of the 10th and 11th Five-Year Plans they managed to mechanize the labor of almost 100,000 workers and to release 38,000 people from heavy physical labor, including 18,000 women. GPZ-4 (Kuybyshev) provides an example of a resolute approach. Here, according to the plan for the 11th Five-Year Plan, as early as 1983 they had practically eliminated heavy physical labor, they had eliminated 710 workplaces that did not meet modern requirements, and 1,100 workers were released from manual labor, including 440 women. In the plant's basic production 14 percent of the

workers are employed in manual labor, as compared to approximately 30 percent in the bearing branch as a whole. The plant workers have set the task of completely automating all production by the year 2000. It would be wonderful to see these kinds of prospects in all plans for social development, for they are inherent in the strategy of acceleration.

Skeptics spare no sarcastic remarks regarding such wishes. In their opinion, the enterprise depends strictly on the suppliers of technical equipment and technology and therefore in the future they will continue to cut the coat according to the cloth. How long will this continue before it has finally gone too far?... Today this opinion has clearly become outdated. Technical progress originates at the enterprise and the collective has the power to influence it. An interesting fact was told to me by the chairman of the trade union committee of the Leningrad Shipyard imeni A. A. Zhdanov, Ye. G. Gogolyukhin. According to the plan it was intended to reconstruct the foundry (and this meant to significantly improve working conditions). The plan for the work was drawn up by a reputable scientific institution and it would seem that there was no reason for doubts. But, following the policy that had been established once and for all, before beginning to implement it the administration in conjunction with the trade union committee followed the path of testing: they turned the plan over for consideration by the shop collective. The discussion revealed serious imperfections regarding the creation of favorable working conditions. Valuable proposals ensued, and as a result the reconstruction was conducted more completely and with better planning.

At the same time one must recall that scientific and technical progress, as a rule, leads to mass release of people. Just as a result of implementing the measures planned for reducing the application of manual labor, by the end of the five-year plan about 5 million people will be released. It is necessary to assign jobs for them. And this means that the measures of scientific and technical progress must be obtained simultaneously with measures for retraining and placement of the workers who have been released. It is not ruled out in the future to reduce wages (or some part of them) for the released worker during a certain period necessary for finding a new job. In any case there is something to think about here.

The traditional section of the plans for social development concerns the movement of personnel. Any of them considers the creation of possibilities for advancement in skills, occupation and position. By the same token personnel stabilization will be discussed at any level. But the times are changing abruptly. Even today about 0.7 million people are being released annually because of technical reequipment and in the future the scope of the release of personnel will increase, which is aided by the application of the method of the collective contract of the Leningrad experiment among designers and technologists and other similar undertakings. Just by following the method of the Belorussian railroad workers it is expected that the enterprises will release hundreds of thousands of workers.

Under such conditions one must plan not stabilization but, on the contrary, greater mobility. There are still frequent cases where reconstruction of production is not accompanied by well-thought-out retraining and placement of



the people who are released. Hundreds of people are released from enterprises and neither the administration nor the trade union committee has any idea of what happens to them. Of course, nobody will be left without work but such an attitude toward personnel is far from efficient. An example of the opposite is provided by the Krasnyy Proletariy Plant which is known for its developments in social planning and also the high level of stability of its personnel. "We," says the chairman of the trade union committee, S. M. Avtomonov, "prepared ahead of time for the technical reequipping of production. We gradually prepared the personnel. Therefore the newly introduced production for producing robot equipment could be staffed almost completely through retraining of workers who had been released. Moreover more than 90 percent of the workers were transferred to more interesting work that required greater skill and, which is of no small importance, with greater earnings."

This is an example of what I would call a modern approach that is well thought out with an eye to the future. Unfortunately, so far the majority of plans for social development are directed toward increasing the number of personnel. The desire to do this is shown if only by the need to introduce limits on the number of personnel. And yet the restructuring of the economic mechanism and acceleration of scientific and technical progress inevitably lead to mass release of people. And it is necessary to prepare for this beforehand.

Plans for social development encompass questions of raising the level of education of the workers. What shift in focus should take place concerning this section? First of all formal education proceeds at its own pace and the enterprise need not apply any additional efforts in addition to those that are being applied now. But attention should be focused on preferential training for female workers with children under 8 years of age so that they can be released from work and retain their wages. The decree of the CPSU Central Committee and the USSR Council of Ministers, "On Measures for Further Improving Training and Increasing Qualifications of Workers in Production" offered favorable opportunities for solving this problem but they are clearly not being fully utilized. And yet practice shows that a woman who is away from production for a certain period of time because of the birth of a child lags behind the men in raising her general educational and skill level. Social planning should draw attention to this as well. Perhaps through material incentive funds women could be released from work one day a month....

Another object of this planning is raising the educational level of youth. On the initiative of the trade unions they are conducting an all-union review of working conditions for adolescents at enterprises and organizations, including measures for raising the occupational level and mandatory training in order for each one to be given a complete secondary education. In plans for social development all kinds of discoveries and methods of solving this problem would be especially welcome. The experience in utilizing incentive payments from the funds of the enterprises is interesting. In the Tiraspol Production Sewing Association imeni 40-Letiye VLKSM, for example, in order to stimulate a conscientious attitude toward training, a decision has been made to regularly award bonuses to workers who are studying in evening school and receive only good and excellent grades. In this same collective attention should be given to the system of training literally everyone (in various forms). That is, the

search for new approaches to solving this problem is not only possible, but also necessary.

New requirements are being placed on the section that encompasses the sphere of housing. Up to this point clearly not enough attention has been devoted to this question. It is no accident, for example, that of the estimated funds allotted for the development of Novyy Urengoy, 75 percent were spent for production needs and only 8 percent for the creation of a base for social, cultural and domestic facilities. A similar situation exists at the Stara Starooskolskiy Electrical Metallurgical Combine. Here during the years of the 11th Five-Year Plan the capital investments assimilated in nonindustrial construction were less than half the amount in industrial construction. Moreover, the trade union committees of the aforementioned enterprises did not sound the alarm and did not demand that the administration and the higher agencies change the existing situation. Now such an approach is simply intolerable. The task of granting each family an individual apartment by the year 2000 requires an active search for ways of carrying it out. And these ways are being found. Buildings for housing constructed by the internal financing methods have begun to appear, money deducted for this purpose from the funds for social and cultural measures is increasing, credit can be used, and other additional possibilities are arising. A direct object of the plan for social development are youth housing complexes. When drawing up the plan it is first of all necessary to find and substantiate solutions similar to the ones adopted by the Gorkiy automotive construction workers. It is necessary to have a sharp increase in the provision of housing and here one must consider all possibilities, including new construction, more efficient utilization of the existing housing supply, the cooperative form of housing, and so forth.

The broad scale of collective gardening and orchard raising is also making its way into the plans for social development. Trade union councils have participated in the development and approval in the oblasts, krais and republics of plans for the distribution of collective orchards under the 12th Five-Year Plan. But this is only the beginning. The planning must envision a system of services for members of gardening societies. New forms are needed. Perhaps it is necessary to better utilize the results of more economical expenditure of material resources? Or there should be more cooperatives of workers engaged, for example, in collective rabbit raising, and so forth.

A lot of water has flowed under the bridge since it was envisioned in the plans to improve the provision of seats in dining rooms for workers and organize cafeterias. They thought that this would solve the food problem. Today one can screw up the courage to admit that the problem of food is far from only one of seats and the number of workers in public catering. A clear lesson is provided for all of us by the Riga VEF, where scientific and technical progress led directly into a branch that is so difficult to mechanize and by no means at the expense of the taste qualities of the dishes. Many of the instruments and devices developed by specialists of the association have no analogues in world practice. Time expenditures on obtaining a meal and paying for it have been reduced to a minimum. According to calculations of specialists, just as a result of the catering that has been arranged the labor productivity of workers has increased by 8 percent. A

remark for opponents: the VEF received no preferential provision of groceries and the number of workers employed in the association's catering combine itself was less than half of what it was with the previous organization. Yet it is generally thought that the development of the sphere of services should take place by augmenting it with personnel from the sphere of material production. The experience of the Riga workers provides a convincing example of solutions which would be appropriate in other plans for social development as well. It clearly reflects the internal possibilities of the labor collectives and it is no wonder that it was given the State Prize in 1986.

Many socioeconomic experiments are being conducted in the national economy. If one does not enter into this and tries to find a place to sit out the time one can easily fall back. The arrears will be shown by the old content of the social plans. The old means nonmandatory assignments that are not reinforced with the material, financial and labor resources or human resources, that is, the desire to carry out what has been earmarked through initiative. Take, for instance, the Ministry of the Coal Industry, the Ministry of the Petroleum Industry, the Ministry of the Mineral Fertilizer Industry, the Ministry of Power and Electrification, the Ministry of Land Reclamation and Water Resources and a number of other union ministries which repeatedly throughout the 11th Five-Year Plan failed to fulfill state assignments for introducing housing. Moreover, these assignments were indicated in the plans for social development. Under the new conditions of management that are favorable for the collectives it is necessary to seek out possibilities of radically solving social problems. This does not mean a trivial reduction of the proportion of people employed in manual labor by a couple of percentage points, but all-encompassing, comprehensive mechanization and automation. Not a reduction of the time period for waiting in line for an apartment from 20 to 17 years, but complete satisfaction of the demand for housing on the part of all workers in the next few years, and so forth.

The new methods of management provide an organizational-economic and management-legal basis as well as prerequisites for a radical solution to social problems of labor collectives. Science and practice provide social planning with a methodology and management methods that correspond to such a change. I have in mind above all the target-program approach. A social program is primarily a means of accelerating the resolution of problem situations. The target-program approach has been accepted at such enterprises as the Tiraspol Production Sewing Association, the Pavlodarskiy Traktorny Zavod imeni V. I. Lenin Production Association, the Dnepropetrovsk Machine-Building Plant and so forth as well as in the regions. For example, the Latvian Republic Trade Union Council is implementing the comprehensive target programs entitled "Mechanization," "The Brigade," "Competition and Experience" "Health," "Production Life" and so forth, which make it possible to concentrate material, monetary and human resources on solving crucial problems. The plan for the social development of the labor collective is unthinkable today without programs, not in the sense of a document, but in the sense of a radical improvement within the shortest possible periods of time. Otherwise it will not work.

A fairly solid methodological and methods base has been prepared for social planners. In 1986 the collective of authors completed work on the publication of the methodological recommendations entitled "Planning Social Development of the Collective of the Enterprise" (Moscow, Profizdat, 1987). With the participation of the AUCCTU the corresponding recommendations were published for the branches and regions.

I wish to draw attention to one other document in whose drawing up I had the honor to participate. About a year ago the USSR State Committee for Labor and Social Problems, the USSR Academy of Sciences and the AUCCTU adopted provisions concerning plant sociological services. One must say that the official origin of the services at the enterprises was largely due to social planning which instilled in executives and trade union workers a taste for social control. Plant sociological services should become an agency for this kind of control and should take responsibility for guiding social planning.

In conclusion, one problem for which it is easy to check to make sure that the plans for social development that are drawn up meet today's requirements. I am speaking about increasing the coefficient of shift operation of equipment. Traditionally the problem is linked to difficulties with employment on the second and third shifts. Here is an example where people enter on the wrong path from the very beginning. Several years ago I was invited to the inspection by the Commission of the RSFSR Supreme Soviet of the State of Affairs with respect to labor discipline at the Lipetsk Tractor Plant. The inspection showed that many of the people employed on the second shift left their work places long before it was over. It seemed that everything was clear: the discipline was low and they did not have the proper control. But the leader of the brigade of inspectors, a deputy to the RSFSR Supreme Soviet, and a USSR cosmonaut A. Nikolayev suggested looking a little deeper. An analysis made it possible to find the cause in the operation of urban transportation: the service turned out to be so bad that it was not possible to take everyone home from the second shift until 3 o'clock in the morning. Naturally, the workers tried to get home earlier than that and violated discipline.

Consequently, it is not difficult to introduce new shifts and it is easy to introduce to increase the demand for discipline as well. It is much more difficult, but unavoidable, to restructure the work of transportation and the sphere of consumer services and leisure. Such is the task of the plan for social development not only of this enterprise, but of the rayon and city. An even higher and more worthwhile task is to increase the shift work of equipment, involving as few people as possible. This is being done in an interesting way at the Poligrafmash Production Association in Leningrad: with the organization of two- and three-shift work, the sections with modern, highly productive equipment based on the principle of technology involving few humans were the first to be changed over to the new conditions. A significant increase in output was achieved by transferring relatively small groups of workers to this schedule. Apparently the principle should be: the coefficient of shift work of equipment outstrips the coefficient of shift work of employees



In these remarks I have dealt only with a small proportion of those changes that the planning of social development is undergoing and should undergo. It is almost a quarter of a century old. People this age are maturing and acquiring completely new qualities. The current stage is called upon to be a turning point for the planning basis of concern for Soviet people as well.

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## PETROLEUM INDUSTRY DEVELOPMENT TO BE ACCELERATED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 95-100

[Article by N. N. Leshchev, chief of the Administration of Main Petroleum Pipelines of Western and Northwestern Siberia (Tyumen): "What People Can Do"]

[Text] In July 1986 in Ufa there was a conference of Glavtransneft to which the leading administrations of main petroleum pipelines (UMN) were invited. Problems of accelerating the development of the subbranch under the current five-year plan were discussed. The task is understandable, as it is for the entire country. What was not completely understandable was the opinion of certain participants who for some reason counterposed scientific and technical progress to the organized, "human" factors in acceleration. Such a juxtaposition, in my opinion, is incorrect.

The possibilities of scientific and technical progress were carefully analyzed in our UMN. The calculations showed that it is possible release approximately 600 workers. This is a considerable number but it is was suggested to us, taking into account the experience of the Belorussian railroad, to bring the increase in labor productivity during the five-year plan up to 25 percent. This task cannot be accomplished as a result of scientific and technical progress alone. It should also be noted that the new projects in the Far North require about 2,000 additional workers, which it will be difficult to obtain under the conditions of the shortage of labor force. Only one solution remains: to rely on socio-organizational factors and reserves for increasing the effectiveness of production, to which the participants in the aforementioned conference were fairly indifferent.

I have been able to see for a long time how people work and what they can and cannot do. They can do things because they want to and therein lies their force. They cannot do things because they are not permitted to. For instance, the majority are prepared to follow the example of the VAZ workers and work four shifts for the construction of facilities for social, cultural and domestic purposes. If administrative workers of the UMN were to apply their labor, it would amount to almost 50,000 man-hours. Since they would be constructing a residential building for themselves, this would be serious work with a full measure of output per man-hour, and not simply a matter of putting in their time as is sometimes the case. The builders are also prepared to pay

for the labor of volunteers. But, alas, they cannot do the construction because construction workers have no limit on labor and additional labor is not included in the plan. They do not want to go against the plan: tomorrow the people who want to increase the output of staff workers will start "from the level achieved" when establishing the norm for the new year, with all the consequences that ensue from this. It would seem that everything has been done "correctly," as the sports commentator who is my namesake, N. N. Ozerov, loves to repeat, but the potential labor will not be invested. What is stopping it? The existing economic mechanism and behind it, of course, there is also a person.

Incidentally, even under the conditions that exist the manager cannot just sit with his hands folded. I, like, incidentally, any one of my colleagues, could share my experience in how to get around the "red flags" of prohibitive provisions. Not through cunning or even barter or forgery, although it is easy to generate suspicion of this. Let us say that a swimming pool is constructed under the title of a "facility for production purposes." At first glance this is a lie. But let us look a little deeper: the swimming pool is constructed for people and for the strengthening of their health. A healthy person works very productively. So here is a direct "production purposes." But here is an example where the interconnection is even more direct: having become familiar with the watch method from reading EKO, in Alaska they made a quite reasonable decision. The swimming pool in the administrative residential complex simultaneously serves as a reservoir for firefighting. It turns out that this is possible too.

When one finds a way out of the intrigues of the economic mechanism, like the one just described, one feels satisfied. But I do not like these partial successes. It is necessary for the mechanism to open up more completely to man and to his initiative. But the human factor must be understood more broadly than it usually is. Frequently it is assumed that if you build for a worker housing, a kindergarten, day nurseries and dining room, give him more wages and provide him with commodities--he will disclose his capabilities in labor with a maximum output. Today we are becoming convinced that these prerequisites are not enough. In our UMN at the Ilichevka Station an unplanned experiment was conducted: we got hold of a conscientious contract and we ourselves persistently struggled for prompt and complete introduction of the social infrastructure. As a result, next to the station there arose a fairly good little city which others might envy. Alas, nobody would be in a hurry to go to the taiga, into the remote areas, although they would have received an apartment immediately. Young specialists would spend the 3 years there after completing the VUZ, as if they had dropped out of life. Apparently they require much more than the minimum of social, cultural and domestic facilities.

The search for ways of putting the human factor to work led me to the Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences. I went to Novosibirsk with the deputy for economics, F. F. Levin. I think we were lucky: the institute is studying an experiment in the application of the collective contract in large subdivisions and at enterprises. Here we heard from the specialists a clear and correct understanding of the collective contract and we understood

that this is what we need. Here is a fundamental solution to the problems of labor and a method that makes it possible to reveal the human factor, initiative, love of labor, inventiveness and enterprisingness of the masses. The entire wage fund for the work that is performed, regardless of the actual number of personnel, is at the disposal of the collective--this is the most attractive condition of the contract. It is also caused us to think about how people are working at our enterprise and how they could work if these extremely immense reserves were revealed.

The UMN did a calculation of the proportional number of personnel of oil-pumping stations. Each of them has an average of 2.8 people as basic production personnel. The achievements of scientific and technical progress proposed by the branch will make it possible to reduce this number to approximately 1.9. But there are also auxiliary and repair workers working at the station, and 10 times more of them than the basic workers. Herein lie the largest reserves which, we decided, the collective contract could help us utilize.

The administration concluded an agreement with the Institute of Economics concerning creative cooperation. After we went home we "agitated" to change three stations over to the collective contracts which were selected so that they would be representative with a whole totality of such subdivisions. A curious fact: I had only spoken at the stations and discussed the idea and the conditions, including the main one, emphasizing its stimulating force, and had not yet drawn up any provisions or concluded any agreements, but the people already began to change their behavior radically. I went again to the watch and saw that they had one more worker. I thought: Those sly devils, in order to increase the normative for payment they added a new worker so that they would have a larger base. Later I understood my mistake: it turned out that I had counted one of the shift replacements as "extra." Having worked the night shift, and having rested and eaten, he came to help his comrades. In the past he would have stayed away, not knowing what to do with himself because of boredom.

Thus, displaying additional zeal, it is as though the workers themselves are reducing the base amount for calculating the normative in the wage fund. I asked and they understand this fact, but on the threshold of the new method, developing initiative, they wanted to work in the new way. I could not but draw attention to the cleanliness of the premises. People were not allowed to go in in boots; they could only wear slippers on the rug. In order for the boots not to make tracks as they had done before, they carefully cleaned the sidewalk. When it is clean there is less other cleaning work and fewer cleaning people. Fewer people in the station means less garbage and dirt.

Which reserves can be seen behind the collective contract? The reserves that are revealed by the workers themselves. For example, at one of the stations that had been changed over to this method the number of personnel was about 90. I am confident that this will decrease by no less than one-third. Incidentally, in the watch brigades that had been changed over to the collective contract earlier, instead of the calculated 20.5 people there are only 12 left. (Further reduction of the number of personnel, out of considerations of technological discipline and technical safety, are simply



not allowed by the agreement of the contract or else there would be even fewer people on the watch.) I reported on these prospects at another conference, this time in Omsk. It seems that I managed to convince them that the human factor is capable of producing an immense advantage. The question arose of what to do with the workers who were released. For the UMN the answer is clear: the UMN receives a wage fund to pay the normative number of workers, taking into account an expansion of the number of projects and, because of the collective contract, it costs less to engage additional working hands. Knowing what it takes to attract a person and get him settled in the North, it is easy to imagine how great the national economic effect from such an approach is.

I am convinced that human initiative will be revealed in all its fullness within the framework and under the conditions of the collective contract. In conclusion I should like to add another stroke to the sketch of the human factor: the risk which the executive is prepared or, conversely, is not prepared to take. One example: we know of the damage caused by petroleum that is leaked into a body of water. The best method of avoiding this is to burn the liquid before it has had a chance to get into the water. But the instructions do not recommend such a solution. If there is an accident on a pipeline, the time to react is very short. Having laid everything, I ordered: Light the fire! The flow of oil stopped a couple of centimeters from the river. Risk had not been ruled out. In similar situations people have burned business structures, boat stations and forests, but the losses cannot even be compared to the probable harm from pollution of a body of water.

Unorthodox decisions involve risk. Our plants envision constructing an additional 29 oil wells. Again we are looking at the prospects, weighing the arguments, drawing attention first of all to such criteria as economy and reliability, and we find this solution: to limit ourselves to 12 stations. Hundreds of millions of rubles in savings. The proposal is sent to our associates--the petroleum extraction workers and to the higher agencies. Where is the risk? In the first place, the administration will not receive all of the wage fund which was to amount to more than 7.2 million rubles. In the second place, the equipment has already been ordered through imports and it will be necessary to pay a fine, and the people responsible for this will mobilize all kinds of arguments against this. Without boasting, however, I will say that the possible personal unpleasantness is nothing when compared to the national economic advantage. I see a lot of justification for such steps for all of my colleagues who are managers. Let everyone take the step, perhaps, with risk for himself, but not on behalf of everyone. This should be done by the person who is the manager. After all, he is also an element of the human factor.

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## ORGANIZATION OF COMPETITION DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 100-107

[Article by V. G. Smolkov, doctor of philosophical sciences, professor, editor in chief of the magazine SOTSIALISTICHESKOYE SOREVNOVANIE: "Reference Points of the Competition"]

[Text] The powerful potential of competition is being utilized poorly today. Its forms and criteria developed under the conditions of extensive development of the economy. A good deal has already become outdated, lost its stimulating role, and in some ways has become an impediment. The retardation of the rates of the country's socioeconomic development in recent years has been the consequence not only of serious mistakes in the area of economic leadership, but also of shortcomings in the organization of competition.

The decisions of the 27th Congress and subsequent documents of the CPSU have clearly formulated the directions for reorientation of competition under the conditions of intensification of the economy. The essence of the changes lies in shifting the center of gravity from quantitative indicators to quality and effectiveness, from intermediate results--to final results.

It is noted in the decree of the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU and the council central committee, "On the All-Union Socialist Competition for Successful Fulfillment of the Assignments of the 12th Five-Year Plan," that the main goal of the competition is considered to be a radical increase in labor productivity, improvement of product quality, savings on all kinds of resources, unconditional fulfillment of contractual commitments, and strengthening of labor discipline. Taking into account the new orientation, the decree has recognized it as inexpedient to conduct competition for intermediate results, the fulfillment of individual indicators or the production of individual kinds of products.

The 27th Party Congress gave a high rating to the experience of the Leningrad workers in the development and implementation of the "Intensifikatsii-90" program, the Ukrainians--for the creation of scientific and technical complexes and engineering centers, and the workers of Zaporozhye Oblast, where they managed to appreciably reduce the number of people employed in manual jobs.

The collectives of a number of machine-building enterprises of Novosibirsk, Sverdlovsk and Kharkov oblasts have committed themselves under the 12th Five-Year Plan to changing over completely to the output of basic products that surpass the best domestic and world models in technical level and quality.

The commitments of the competitors must be extremely concrete and supported materially and organizationally. The secretariat of the AUCCTU has approved the initiative of the brigade of Karachurov from the Chelyabinskiy Traktornyy Zavod imeni V. I. Lenin Production Association, which challenged its comrades in labor to achieve under the 12th Five-Year Plan the highest qualifications and the highest occupational mastery. Here they have developed a concrete program for achieving this goal: as early as 1986 25 brigade members were taught advanced methods and ways of working with new technical equipment, 10 of them will acquire related occupations of operators and adjusters of machine tools with numerical program control and processing centers. In the economic training networks the networks master the fundamental principles of functional cost analysis. All 50 members of the collective by the end of the five-year plan will have a general secondary education, 10 of them--a technical secondary education, three of them a higher education, and 14 people will be studying in the evening division of the Polytechnical Institute. All kinds and forms of increased knowledge, including self-education, are directed toward continuous training and retraining of personnel, which mediates the process of direct assimilation of new technical equipment and the development in each worker of qualities of a true master of production.

At the beginning of the 12th Five-Year Plan there was many valuable initiatives directed toward significantly increasing labor productivity. A clear example of this is the initiative of workers of the AvtoVAZ Association. The association's collective developed concrete proposals for increasing the effectiveness of production and improving product quality, which significantly exceed the control figures for the five-year plan. It was decided to extend the guaranteed service life of new models of motor vehicles by a factor of 1.5. The collective asked to have its proposals included in the state plan. This initiative, which was approved by the CPSU Central Committee, received broad support in many branches of the national economy. Many workers committed themselves to fulfilling the plan for 2 years of the five-year plan for increasing labor productivity with excellent product quality by the 70th anniversary of Great October.

The initiative of labor collectives have made a commitment to provide for above-plan increase in labor productivity of 1 percent and more during the first year of the 12th Five-Year Plan deserves a high rating.

Among the priority goals of the competition under the current five-year plan is sufficient utilization of labor, material and financial resources. Under the new five-year plan the increase in the need for them will be covered mainly as a result of savings. It will not be simple to carry out this task. After all, we have never before had such rates of economizing on resources. The answer could again be competition. "Each month of the 12th Five-Year Plan--one above-plan day!"--such is the model of the competition developed in Sverdlovsk Oblast.

Many of the labor collectives, following the example of AvtoVAZ and the Sumy Machine-Building Plant imeni M. V. Frunze, committed themselves to earning the money necessary for technical updating of production. Beginning in 1987 more than 200 other large enterprises of the country will change over to principles of self-financing and self-supporting production.

At the center of party economic policy and all practical work is the task of improving product quality. In the best labor collectives an essential goal in improving quality is played by comprehensive systems for product quality control (KSUKP). At enterprises where the KSUKP is in effect, the proportion of products of the highest quality category in the overall production volume is higher by an average factor of 1.5, and losses from defective work less by a factor of 3-4 than they are at enterprises that do not have this system.

The experience of the Dnepropetrovsk Combine Plant in certification and streamlining of workplaces can help to reveal and utilize reserves for improving the quality of labor. During the process of certification each work place is evaluated in terms of the totality of technological, organizational-economic and social criteria. More than one-third of the country's industrial enterprises have already achieved an increase in labor productivity and an improvement in product quality as a result of certification. In 1986 certification was completed at all industrial enterprises of the country and by the end of 1987 it will be complete in collectives of the other branches.

The highest standard of product quality is its ability to compete on the world market in the expansion of exports on this basis. Enterprises that are successfully competing in the world market with the leading firms have special advantages. They should have more funds for production and social development and wages than others do. When summing up the results of competition preference should be given primarily to those collectives and leading workers who not only have the highest labor productivity in the branch, but have also reached the world level or come close to it.

One of the main goals of the labor competition is unconditional fulfillment of orders from the entire list of products and on time, and also strict observance of contractual discipline. A good support here is the organization of all-encompassing competition along technological chains and the development of competition among associated workers. "The Goal Is the Final Results"--such is the motto.

The competition among associated workers has stood the test of time and proved its viability. It played a positive role in the construction and startup of capacities and facilities of Sayano-Shushenskaya, Krasnoyarskaya, Nurekskaya, and Ust-Ilinskaya Hydroelectric power stations, KamAZ and Atomash. A good deal of experience in organizing this competition has been accumulated by workers of the Leningrad Transportation Center, metallurgists of the Ukraine and Cherepovets and the builders of the main gas lines.

The competition of associated works, which originated within the collectives of enterprises, have gone beyond them and become interbranch in nature. This



is a competition among enterprises that are partners in producing the final product, a cooperation of collectives of a number of scientific research institutes that are working together on the same subject; creative cooperation of production and scientific research enterprises; competition of the collective of associated workers in the chain; scientific research institute--planning institute--construction organization, and so forth. Now the competition of associated workers is developing in the implementation of target comprehensive interbranch programs--energy, consumer goods, reduction of the application of heavy manual labor, and so forth.

In past years a certain shift has taken place in the direction of technocratic approaches to social problems. We have paid less attention to the social aspect of production, life and leisure. Social functions have frequently been ignored in the organization of competition.

By which indicator should one evaluate the social results of the competition? The system of indicators that reflects factors of social development should include those which characterize the rise in the cultural-technical level of the workers, improvement of working conditions and the culture of production, increased discipline, and a higher level of consumer services.

At the beginning of 1987 the collectives that win in the all-union socialist competition will have deductions into the fund for social-cultural measures and housing construction increased by 25 percent, and in the branch--by 15 percent at the expense of the reserve (centralized fund) of the higher organization. All Challenge Red Banners in the all-union socialist competition will be conferred only with the fulfillment of plans in terms of the most important production indicators and the construction of housing and social-cultural facilities.

More active support should be given to the initiative of the Komsomol youth brigades that have committed themselves to working no fewer than 4 days off during 1987 for constructing housing, schools, hospitals, clubs and sports facilities.

The Latvian SSR Ministry of Local Industry is going planned work for improving the organization of competition at enterprises. Here they had clearly stipulated that each manager, regardless of the position he holds, is the immediate organizer of the competition in the collective of which he is in charge. A comprehensive system has been introduced for organizing the competition in the branch. The experience of management and trade union organizations of local industry in the Latvian SSR for increasing the role of management workers and specialists in the development of competition has been approved by the AUCCTU and the USSR State Committee for Labor and Social Problems.

Sometimes one hears that there are a few too many new initiatives at the enterprises! True, there are quite a few initiatives, but is this anything to be upset about? Rather one should be glad because this is the direct result of the increased activity of the workers. Should one hold back the desire of participants in the competition to come out with a new initiative? It would seem that one should not. But to select from the dozens and hundreds of

undertakings the most valuable and useful--this art must be mastered persistently, every day.

In recent years the competition has been to a significant degree broken off from the principle of payment according to labor and has not been properly reinforced with material incentives. This has reduced its effectiveness and a certain disparity has formed between the basic system of stimulation of production and the stimulation of competition. In practice it is mainly the autonomous, separate system of incentives that is used and the competitors, as a rule, receive insignificant amounts of money that are allotted for bonuses, and this is only for the winners, and hence the inadequate influence on all the rest. Moreover the basic system of stimulation of production activity does not fully reflect the real contribution of the workers to the final results of production.

But there are still frequent cases of leveling in the distribution of bonuses. Frequently the amount of the individual bonus does not exceed 3-5 rubles, and so the worker does not perceive the bonuses as a stimulus. As a result, significant amounts of money are spent on paying bonuses and there is no appreciable improvement in the work indicators.

Frequently the incentives for the leading workers amount only to monetary bonuses. Such forms of encouragement as awarding valuable gifts, passes to houses of recreation, tourists' passes, subscriptions for theater tickets and so forth are used poorly. Yet practice shows that it is precisely these forms of immediate incentive that are the most effective.

The capacities of housing construction enterprises are utilized by an average of 80 percent, and as a result we annually fail to receive 13-14 million square meters of dwelling space. The volume of incomplete work on the buildings that are introduced amount to approximately 2 percent of the estimated cost. Eliminating them and redoing effective work annually costs 350-400 million rubles--the equivalent of residential buildings with an overall space of 1.5 million square meters. Of the approximately 17 billion rubles allotted for capital repair during the five-year plan only 80 percent is assimilated, as a result of which the housing fund runs out ahead of time. Just in the cities of the country each year 10-11 square meters of overall dwelling space is demolished, which is equal to the total supply of a large oblast center. The volume of reserve is twice the normative amount. As of 1 January 1985 buildings with an overall area of more than 100 million square meters were in the construction stage while the normative is 50-60 million square meters. In the cities 2-3 percent of the housing supply is always standing idle.

In 1981 at the request of the trade unions 9,846 officials were released because of violation of the rules for the protection of labor, and in 1985--9,927 were.

In 1981 trade union technical inspectors imposed fines on 58,307 officials, and in 1985--75,652.

During 1985 2,332 new subsidiary agricultural enterprises and organizations were created and their overall number reached 19,400. The subsidiary farms produced more than 350,000 tons of meat (in live weight), 579,000 tons of milk, 429.6 million eggs, 414,500 tons of potatoes and 364,000 tons of vegetables. During the years of the 11th Five-Year Plan meat production doubled, milk production increased by 44 percent, potato production--by 32 percent and vegetable production--by 28 percent. The presidium of the AUCCTU ordered the completion under the 12th Five-Year Plan of the creation of subsidiary farms in all organizations which are capable of working them and by the end of 1990 increasing meat production per worker in the branches to 15-25 kilograms (in live weight) and milk production--to 50-100 kilograms.

Many enterprises of the RSFSR, Belorussia, the Ukraine and other union republics devote a good deal of attention to bringing consumer services to the workplace. As a result of funds of enterprises they are providing for more than a 50 percent increase in the production capacities for consumer services. An especially large amount has been done in the textile industry. As selective investigations show, at those enterprises where there are no consumer service facilities the number of leaves associated with obtaining consumer services is 20-25 percent higher than at enterprises that have consumer service facilities.

By the end of the 12th Five-Year Plan it is intended to fully satisfy the needs of the workers for public catering at the workplace, to expand the specialized network of consumer service enterprises, and to considerably improve the quality of the food that is prepared. The cost of food in working dining rooms is an average of 24-40 percent less than at other types of public catering enterprises. Prompt and high-quality food service at the place of work makes it possible to increase labor productivity by 7-8 percent. A total of 146,000 dining rooms and cafeterias have been opened to accommodate 8 million, which is twice as many as at the beginning of the 9th Five-Year Plan. More than 10,000 mechanized lines have been installed for distributing meals (1,400 at the beginning of the 9th Five-Year Plan). All meals are provided by the subscription system for 76 percent of the workers.

One of the areas of the activity of trade unions is contributing to the development of trade service at the enterprises and organizations. The network of culinary stores and sections has grown to 12,500 here. More than 11,000 stores and stands for preliminary orders that opened up at plants, factories, construction sites and on transportation.

During the past 20 years the housing supply in the country has doubled and reached 4 billion square meters, and 80 percent of the population in cities live in separate well-arranged apartments. Housing conditions have improved for approximately 10 million people a year. But there are a number of problems. With an overall area per city resident of 11 square meters (living space--9.4 square meters) more than 11 million people occupy less than 5 square meters, 6 million people actually do not have a permanent residence, 1 million families live in dormitories for single people, and about 6 million people are living in dilapidated buildings and barracks. The overall number of people in need of improvement of housing conditions is 20 million and the average time of the wait to improve them, as before, exceeds 10 years.

Approximately one-fourth of the families receive their apartment 15 years after they were formed, and about 15 percent wait for 20 years.

In 1985 52 million people rested on passes to health resorts in the country. In the USSR there are 2,267 sanatoriums, 761 houses of recreation, 467 boarding houses, 149 boarding houses with therapy, 3,091 preventive medicine sanatoriums, 7,878 recreation bases, 962 tourist bases, and 22 alpine lodges. For parents with children we have opened 25 sanatoriums and 710 houses of recreation and boarding houses.

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## IMPORTANCE OF INNOVATIVE THINKING STRESSED

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[Article by P. G. Oldak, doctor of economic sciences, Novosibirsk State University: "A Change of the Paradigm of Economic Thinking"; a discussion; first paragraph EKO introduction]

[Text] Stereotypes of awareness have a high level of stability. A certain amount of conservatism is caused by their functional purpose--maintaining a given model of behavior. Therefore the assertion of the new always related to the disturbance of the previously established stereotypes. Today we will have to overcome the inertia of the stereotypes of economic thinking from the period of prewar industrialization, within whose framework the integrated system for management of the national economy developed. The tasks of industrialization were carried out in a short historical period (13 years). And the paradigm (overall model) of economic thinking that took form at that time was given exceptionally high authority. It has remained unchanged in its basic features until recent years. Now we are beginning to rethink it.

We must fearlessly reject everything that has outlived its time, inertia of thinking, and schemes and approaches that are customary but useless today.

--M. S. Gorbachev

### The Modern Stage of Industrial Development

The epoch of industrial development of mankind can be arbitrarily divided into three stages. The first began with the industrial revolution of the 18th century when machine production came to replace handicraft shops and manufactories. It continued right up until World War II. Its typical feature was a direction toward reducing production outlays. Hence the overall tendency toward reduction of prices.

The second stage is linked to the postwar scientific and technical revolution which opened up the possibility of rapid improvements in the quality of the goods that were created and the realization of immense technical plans. New sources of energy appeared (atomic electric power stations), modern means of transportation (jet aviation, high-speed railroads), and electronic computer

equipment, man went into space, he began industrial assimilation of the resources of the world oceans, and he came right up to the point of creating biotechnological industrial systems. At the same time public production outlays increased rapidly. As a result, the long-lived tendency toward reduction of prices was replaced by the opposite--their rapid growth.

What caused this?

The fact that production was directed toward qualitative changes caused an increase in expenditures on equipment and an increase in the value of the workplace. For example, in the electronic industry in the United States during 1980 it amounted to an average of about \$12,000, the automotive industry--\$20,000, the chemical industry--\$46,000, and the petroleum and gas industry--up to \$200,000. It is expected that by 1990 the value of a workplace in the electronic industry will increase by a factor of 10.

Expenditures on labor force also increased because of the need to rely on highly skilled workers and to spend considerable amounts of money on training workers to operate technical equipment and organize production at a given firm and also the increased responsibility for operating more and more costly equipment. Thus in Japan by the beginning of the 1980's a unit of private capital investments increased in value (in current prices) by a factor of 2.4 as compared to the middle of the 1950's, but the cost of labor force during that same time increased by a factor of 15.6.

Expenditures on scientific research and development as well as on the sale of goods (advertising) increased sharply. The overall expenditures on advertising in the United States considerably exceed the money allocated by industry for research and development. According to estimates of American sociologists, only 10 percent of the patents justify the research expenditures and expenditures on patenting, and only 2-3 percent of them are highly profitable. The cost of development on the basis of qualitative changes is eloquently shown by these figures: depending on the branch and the difficulty of the problems that are dissolved as well as the degree to which they are developed, from 50 to 90 percent of the research in the processing industry of developed capitalist countries ends up without results, and approximately 80 percent of the failures are discovered in the stage of selling the new goods.

One should note the extremely high rate of renewal of products. The list of items of machine building, chemistry and construction materials in the United States previously changed almost completely in 20 years. In recent years this tendency has been getting stronger. It is expected that in 1986 in the United States one-third of the goods will have analogues with the products lists of 1982.

The increase in production outlays and prices was exacerbated by the essential diversion of resources for the arms race (on the basis of scientific and technical progress they began to create more and more expensive systems for attack and defense).

The 1970's turned out to be a turning point in the postwar development of the world economy. One after another global crises developed (ecological, energy,

raw material, food) and the demographic situation was aggravated. There was a sharp reduction in the growth rates of the national product and labor productivity. Capitalist countries encountered previously unprecedented inflation and unemployment, the developing countries--immense foreign indebtedness, and the socialist countries--a decline in the effectiveness of the utilization of the industrial potential and a retardation of the rate of technical progress. These aspects that have been noted show the exhaustion of resources of the second stage of industrial development and the need to change to the next one.

The third stage of industrial development (since the end of the 1970's) is characterized by radical changes in the development of productive forces, new and much more rigid conditions for the utilization of nature and a sharply increased significance of the human factor.

The change in the development of productive forces is the latest phase in the world scientific and technical revolution, whose essence lies in the formation of technological system that provides for accelerated updating of qualitative parameters of products with a consistent reduction of production outlays.

Technical progress of past decades, multiplied by the immense scope of production, has determined new conditions for the utilization of nature. This point requires special attention. Of all the factors in the long-term development the decisive one is the condition of the natural systems. It is impossible to provide for stable economic growth if the productivity of the natural complexes is undermined. It is impossible to solve social problems if the environment for human habitation is degraded.

For a long time economic science proceeded from the premise of the high stability of the natural basis and, consequently, its unchanging nature within the horizons of the solutions that were considered. This was an age when the overall influence of production on the environment did not exceed the limits of the self-restorative potential of the ecological systems. Today the situation has changed: in terms of many parameters the anthropogenic load has significantly exceeded the limits of the self-restorative potential of the natural complexes. At the regional, national and planetary levels one can see a degradation of the water systems, forests and soil cover; pollution of the environment with sulfuric oxides, nitrogen and carbon; the diversity of forms of life on land and in the world oceans is decreasing. After the avoidance of a world thermonuclear war this is the most complex and responsible task. The growing destruction of natural systems shows that mankind has reached one of the most important landmarks in history: the landmark that requires a change in the overall principle of the utilization of nature and a switch to a new stage of material culture that is compatible with the natural system.

Everything living can present the conditions for its existence--even is the general law of nature. For all biological forms, with the exception of man, this means life at the limits of its ecological strength. Man, by transforming nature, goes beyond these limits and restructures the natural complexes in his own interests. But he cannot go beyond the limits of the overall law of nature either. Transforming activity is limited by a strict requirement: the load of social structures (conditioned by the number of

population, the scope of the economic complexes, the level of technology, the purposes of production and consumption) must not exceed the potential of natural systems (that maximum load which they can stand without losing their ability to restore themselves).

Modern civilization is the first global civilization in the history of society. Today we have reached the limits of replacement of natural systems on the scale of the entire planet. This is what makes the problem especially crucial. Our civilization is the first technical civilization in history, which has reached such a level of development where the growth of production can be provided with a consistent reduction of the unit's loads on the natural complexes. Hence the possibility of overcoming the complicated ecological situation by changing over to a higher stage of the development of material culture--balanced utilization of nature. The latter means that the society refrains from the narrow consumer approach to the utilization of natural systems and allots a strictly determined part of the national product as an insurance fund (the fund for maintaining a full-value medium for life). Experts think that about 5 percent of the gross national product should be used for this. Of course it is not simple to decide on this, but in reality this path is undoubtedly much more promising and reasonable than the one that leads to an undermining of the productive force of the natural complexes and the destruction of the conditions for living in the environment.

A prerequisite for the changeover and one of the features of the latest stage in industrial development are changes in the description of the human factor. During past decades there has been an essential restructuring of the value orientation of the selection of vital goods:

today in developed countries the norm has become the consumer standard that includes an individual apartment, its furnishings, modern household appliances, and a car or motorcycle;

the quality of consumer goods in any country as compared with the world level and preference is given to high-quality goods;

the demands placed on working conditions, housing and the sphere of services have increased.

The counterdemands placed on the qualitative characteristics of labor are also increasing--qualifications, responsibility, initiative and reliability of each worker (we shall return to this somewhat later). An awareness of the immense potential that lies in man's capabilities has determined the primary attention devoted to education in the selection of forms of management that provide maximum space for creativity at all levels of economic decision-making.

Unfortunately, economic science has not been on top of things. It did not predict the beginning of the new stage in development and did not work out a concept for solving many of the problems being encountered by the society. Moreover, for a long time it was unable to interpret the crises that developed as being the result of the completion of a particular stage in development. Up to this point there is still no unified definition of the changes that are taking place. In Soviet economic literature they used the concept of changing



over from the extensive to the intensive type (path) of economic development, and in the West--changing over to the stage of reindustrialization (repeated industrialization). During a time of transition the role of economic theory increases sharply. It must reveal the profound changes and elucidate that part of the old that is already beginning to depart from the scene and that part of the new which will inevitably acquire force, determine the concept of development and thus create the basis for the development of the new course of socioeconomic policy.

Only on the basis of a changeover to the new stage in industrial development is it possible to resolve the triune task of providing for the country's economic independence, implementing social programs and maintaining a full-value environment for life. Hence the decisive course of our party toward accelerating socioeconomic development establishing new forms of management and a new style of life. "We are speaking about how the Soviet Union will enter the 21st century, what will be the image and position of socialism in the international arena, what is the future of mankind?"--it was noted in the political report of the CPSU Central Committee to the 27th Party Congress.

The key to solving problems of socioeconomic development is mobilization of the human factor. The latter becomes especially important on the plane of the construction of the investment policy as well. Understandably, with the low rates of increase in the national income, the increase in the accumulation fund is not great either. This predetermines the character of the economic maneuver. Let us recall that in order to implement a course toward industrialization of the country we have utilized accumulation in agriculture, light industry and the system of internal loans. Today these paths have been closed off. With the current extremely high interest rates one cannot count on the utilization of credit from outside either. It is possible to increase somewhat the proportion of the accumulation fund in the national income, but this possibility is extremely limited because the mobilization of the human factor presupposes a higher standard of living.

Under the new conditions one of the major factors in development is the changeover from less effective to more effective technological and management decisions, and this means achieving a greater final result with smaller expenditures of resources. The course toward acceleration cannot be realized within the framework of certain forms that have been found at random (even if they are very successful). The tasks consists in being guided by general principles and searching for our own forms with respect to the peculiarities of the regions, branches and enterprises. This search is continuous, just as technical and social development, the change in external conditions, the advancement of new requirements and the appearance of new possibilities are continuous.

The latter presupposes that only the general conditions in a certain exemplary model of regional and branch management should be given centrally, and in the management of the production subdivision space is left for the selection of specific forms. Decisive significance is attached to the selection and advancement of personnel who are competent, responsible and prepared to search for and realize innovations, and to fight stubbornly for the achievement of winning positions in the competition of economic solutions. On the whole

acceleration is interpreted as a process that mobilizes internal reserves of the system by selecting the most rational national economic decisions and constantly being directed toward improving the qualitative characteristics of the production process and the products.

The course toward acceleration is inseparably linked to the rejection of the existing stereotypes of thinking and to a clear understanding of modern problems. Let us note the typical features of the outdated paradigm (general model) of economic thinking:

the idea that labor in branches of material production is productive, and in the nonmaterial sphere it is nonproductive, hence the primary attention devoted to the investment of funds in the latest technology frequently to the detriment of investments in the development of the human factor (education) and conditions for its full-value utilization (social infrastructures);

the idea that stable economic development requires expansion of base branches (the production of energy and raw material). As a result--the orientation toward geological research, increased energy capacities and the production of raw material resources to the detriment of economizing on energy, repeated utilization of resources and searches for replacements (new construction materials);

the idea of the priority of expanding the scope of production as compared to qualitative changes (and this means orientation mainly toward volume indicators);

increased attention to extensive forms of solving economic problems (herein lies one of the reasons for the immense amount of capital construction);

the idea of the undisputed priority of large-scale production over small-scale (as a result--the megalomania and petty inattention to smaller forms.

Let us consider two aspects of the establishment of the new economic thinking:

the changeover to an analysis of exogenic (external) ties of the economic system and the rejection of the postulate of economic growth;

the development without using additional resources.

#### A Changeover to an Analysis of Exogenic Ties of the Economic System and Rejection of the Postulate of Economic Growth

It is known that the subject of economic science is public production (historic patterns in its development, the theory, models and mechanisms for controlling it). Thus at the center of attention has been the analysis of internal (endogenic) ties in the economic system. Yet, as experience of recent decades has shown, large national economic problems cannot be interpreted in isolation from the spheres that lie on the periphery of the economic system. For example, when solving problems of accelerating the country's technical-economic development one cannot do without research of related socioeconomic problems. This includes an analysis of the ties in

technical progress--with the development of information structures (education, science); the provision of complete and efficient utilization of labor resources; the protection of the environment; the monitoring of demographic processes, and the program for raising the standard of living of the population.

And so we are faced with singling out a special class of problems which initially are economic, but in developed form they lie at the juncture of natural, technical and social sciences, and on a broader plane--at the juncture of science, politics and such forms of social awareness as culture and ethics. Let us define these as metasocial problems. Thus we are beginning to consider the economy as a subsystem in an integrated system of social ties--a metasystem which includes social, industrial and environmental protection structures.

In our opinion, if the economists do not learn to understand and solve metasocial problems they will not be able to skillfully coordinate the development of national economic programs. Gaining access to these problems will require changes in the training of economic personnel. They will need not only traditional economic knowledge and mathematical arts, but something more--a new level of thinking, a view of the entire system of endogenic and exogenic economic ties.

The first two stages of industrial development can be combined into one type of development which embodies the principle of economic (essentially extensive) growth. The essence of this problem, which for a long time was considered to be an indispensable postulate of economic theory, consists in the following: the higher final result of the functioning of public production as achieved on the basis of increasing the economic potential (increasing its size, the "weight category"), that is, as a result of additional enlistment of production capital and labor resources. Increasing the load on natural complexes also contributes directly to this.

At the same time in recent decades there has formed a technological system that is characterized by principally new forms of combination of science and production, the creation of new elements of material productive forces (computers, microelectronics, laser equipment, fiber optics, new construction, materials, biotechnology and so forth) and a qualitatively new level of utilization of the spiritual productive forces (the creative capabilities of man). This system opened up the possibility of changing over to the third stage in industrial development, when the principle of quantitative growth was replaced by the principle of qualitative growth, and the orientation toward increasing the economic potential was replaced by an orientation toward increasing the effectiveness of its utilization (higher final results with smaller volumes of created product and resources enlisted into production). In the 1960's the satisfaction of the needs of a thousand people for consumer goods required, conventionally speaking, 20 metal-cutting machines and in the 1980's--approximately 10-12 of these machines.

It seems that it would be possible to define the extensive path of development as traditional economic growth and the intensive path as qualitative growth whereby the increase in the final result is achieved through internal reserves

(qualitative changes in production systems and the products of labor). The extensive or "expenditure" type of development of the economy dooms the country to stagnation. Hence the strictness of the statement of the problem--to change the orientation of economic development. It is not only the scale of the production potential in itself that is important. It is also important how much final product is created, of what quality and at what price.

The postulate of economic growth was reflected in the course of our economic policy in previous years, which can be redefined as an investment relay baton: in the distribution of investments priority was given to the construction of basic production facilities: it was presumed that new facilities would for a certain amount of time be based on the already existing or partially modernized infrastructure; relying on an expanded production base it would be easy for the society to rearrange the production and social infrastructures. During the age of industrialization this approach played a positive role by making it possible to concentrate maximum funds on the construction and equipment of the most important production facilities.

But we must admit that its success was conditioned by the specific characteristics of the productive forces of the prewar period. Regardless of how weak the production and social infrastructures may have been, with relatively small additional expenditures they could serve as a base for the construction of new industrial facilities. The requirements made by production on the level of qualifications of workers were fairly modest and the enterprises operated quite successfully by relying on people who had been trained in secondary school, factory and plant schools and correspondence divisions of the higher school. The requirements for living conditions were also very undemanding by modern standards. The basic residents of the cities were satisfied with the housing they had and those that came from the country were satisfied with temporary structures. People waited patiently for the development of the sphere of services.

Further realization of the principle of the relay baton of investments in the postwar period gave rise to serious difficulties: the interruptions caused by the arrears of warehousing and packaging, the transportation infrastructure (particularly the completely inadequate network of paved roads in rural areas), scientific research and experimental design work performed by production subdivisions and the outdated system of trade organization began to snowball.

In order to mobilize the human factor at the proper level today it is necessary to provide conditions for labor and life in the 1980's and not the 1940's or the 1960's. Primary attention to the development of the social infrastructure is not only the highest social goal (improvement of public well-being) but also unnecessary condition for increasing the effectiveness of public production.

We need a new economic maneuver whereby the principle of the relay baton is replaced by the principle of an integrated solution to socioeconomic problems within the framework of each target program. This is the way we are now approaching the agroindustrial complex: the goal is not simply to produce as large a quantity of agricultural products as possible but to provide for a



maximum output of high-quality products in the final link of the system (sale to the population and exports) with the least possible production expenditures and loads on the landscape, soil and water systems. To do this it is necessary to have selection of agricultural plants and animals, production of agricultural equipment, fertilizers and herbicides, the organization of agricultural production, service for technical equipment, storage, transportation, processing and sale of products.

The postulate of economic growth was reflected also in the desire to increase the scale of new construction as a result of significantly reducing the norm of amortization deductions. As a result there was a retardation of the removal of outdated capital. In 1965 because of obsolescence and wear and tear, they removed 2.1 percent of all the fixed capital in industry, in 1970--1.8 percent, 1975--1.6 percent, 1980--1.4 percent and 1983--1.3 percent. This led to increased aging of the production capital and a sharp increase in costs of maintaining it. Now the service lives of the fixed capital and the USSR is an average of 47.2 years (in the United States--16.7 years). In the latest areas of scientific and technical progress equipment becomes obsolete in 2-3 years.

While yesterday it was asserted that it is cheaper to "construct something new than to redo something old," today the opposite thesis is advanced: "It is cheaper to reconstruct than to construct something new." Updating of equipment is the most economic path to reaching a new technical level within the framework of the already existing areas of industrial development. Under the 12th Five-Year Plan it is intended to make capital investments primarily in the reconstruction and technical reequipment of existing enterprises, increasing their proportion for these purposes in industrial construction from 38.5 percent in 1985 to 50.5 percent in 1990. The coefficient of removal of fixed production capital will increase from 1.8 percent in 1985 to 3.1 percent in 1990, and the active part--from 3.2 percent to 6.2 percent. It is planned to reduce the time periods for development and assimilation of new technical equipment by a factor of 3-4. In the foreground will be the task of raising branches of the production infrastructure to a new technical level: transportation, electricity, petroleum and gas supply, communications, information service and warehousing.

The transformation of the old into the new (the rebirth of enterprises) makes it possible to quickly carry out a technical restructuring without encountering problems of closing down old enterprises and placing the personnel who are released. One can understand what immense significance this has for the socialist system.

It is important to emphasize one more aspect of the problem. We are taking a large step forward by creating comprehensive interbranch scientific and technical centers (following the example of the Institute of Electric Welding imeni Ye. O. Paton), and large scientific production associations (like Kriogenmash and Svetlana). They make it possible to rapidly develop and introduce advanced technical equipment and technology. Without belittling this movement in any way, one still cannot but see that the task here tomorrow will be to catch up to the present in world science.

In order to compete in 10-20 years as equals with the leading industrial centers of the world in the production of the latest generations of computers, robots, flexible production systems, construction materials and biotechnology, in our opinion, it is necessary to create, say, 5-10 national centers which would directly combine not only production and science, but production, science, education and the social infrastructure. We are speaking about technopolises--cities which will be created around enterprises of two or three leading areas of technical progress and will include scientific centers, universities and housing complexes that meet world standards for the quality of life. The strategy for breaking through on the basis of the creation of technopolises makes it possible to find an integrated solution to the complex of tasks related to the achievement and retention of high positions in scientific and technical progress: the formation of "living" knowledge (knowledge of experts), the transformation of this into the latest scientific and technical information, and the embodiment of the information in the final product of production. This is the only way it will be possible in a short period of time to concentrate here the most qualified organizers of production, scientists, workers and educators. We must recognize that in our country, because of the people's attachment to the apartment they have received (the difficulty of exchanging) territorial migration of qualified personnel is extremely low. And if in the technopolises--centers for breaking through--at all levels (production, science, education) they do not gather together the most qualified personnel, the breakthrough will not take place.

#### Development Without Additional Enlistment of Resources

The concept for solving the energy problem. For many decades world industrial production has relied on cheap sources of energy, and the volumes of energy resources applied into production have been steadily increasing. As a result, we have an ingrained idea that stable economic growth presupposes more rapid growth of energy capacities. The energy crisis of the middle of the 1970's showed that the time of unlimited energy has passed and now not a single product or state is indispensable if it has not included an efficient energy policy. Two lines of solutions have appeared here.

The first is a search for new sources of energy and new methods of processing additional energy resources (mainly coal). Here one can clearly trace the possibilities of traditional sources that have been selected. For many years the Soviet Union saw its advantage in the extensive utilization of hydroelectric energy resources. It constructed large GESes which produced a significant increase in energy capacities. But, as experience has shown, we have overestimated the possibilities of increasing the energy potential as a result of the utilization of hydraulic resources. The idea of accelerated development of atomic energy was advanced later. In order to improve the fuel and energy base in the USSR, by the year 2000 it is intended to increase the output of electric energy at atomic electric power stations by a factor of no less than 5.7, and the extraction of gas--by a factor of 1.6-1.8.

Atomic electric power stations are in operation in more than 25 countries of the world. Atomic electric power stations account for more than 9 percent of the world production of electric energy, in France their proportion has reached 60 percent of the nationwide output, in the United States--13 percent,

the USSR--10 percent, and Japan--5 percent. In recent years we have revealed significant differences in the estimation of the prospects for the development of this branch. Thus France has resolutely entered on a course toward the construction of atomic electric power stations while the United States has begun to wind down this program. From 1975 through 1983 the United States postponed the construction of 57 atomic electric power stations and it is expected that in the next few years it will halt the construction of another 16 of these electric power stations. Since 1975 not a single order for their construction has come in from private firms. This course is being followed in spite of the fact that the overall investments in the development of atomic energy by 1984 has reached \$170 billion (for comparison, the American space program cost \$100 billion). The change in the attitude toward atomic electric power stations in the United States was brought about by a sharp increase in the cost of their construction (by a factor of 1- from 1967 through 1970), and the prices of natural uranium (by a factor of 5 from 1973 through 1976), the prolongation of the time periods for construction, and the aggravated safety problem (in 1979 alone they registered 2,300 accidents, breakdowns and other "incidents" at atomic electric power stations).

The facts that have been noted show that there is sufficient justification to regard atomic energy--second-generation energy resources--as a transitional stage to the third generation--the pure sources of energy (sun, wind, thermal and kinetic energy from the world ocean). The most powerful of these is the sun.

The shortcoming of this source is that solar energy that reaches the earth is dispersed and modern industry requires very powerful energy resources. But we shall not forget that it is not only industry that needs energy. About one-third of it is used for heating and heating residential and administrative buildings. Even in such relatively cold countries as Sweden solar energy is sufficient for constant comfortable heating and hot water supply. In Austria the use of solar batteries covers 60-70 percent of the need for hot water throughout the entire year and 80-90 percent from May through September, and in addition to this the discharges of pollutants into the atmosphere are decreasing significantly. The United States has set the task of satisfying 20 percent of all energy needs through solar energy by the year 2020, and within 50 years the country will be able to cover a large part of these needs through renewable sources, and mainly solar energy. In order to reach these goals they need considerable amounts of money which, however, do not exceed expenditures on the development of nuclear energy or the production of synthetic fuel.

The second line for solving the energy problem is the mastery of energy-saving technologies. The sharp increase in the prices of oil and gas in the middle of the 1970's made it necessary to devote constant attention to how energy is being used. An analysis showed that increasing the rates of consumption of fuel and energy resources in industrially developed countries is only insignificantly conditioned by the requirements of technical progress and the development of the economy. A much greater percentage of the increase is related to covering wastefulness in the utilization of energy.

The creation of technological systems that provide for a reduction of expenditures of energy per unit of output is considered by many specialists to be the most effective path to solving the energy problem. Since the middle of the 1970's many countries of the world have been introducing strict measures for economizing on fuel and electric energy. These have produced an appreciable result. Thus during the past 10 years the United States has reduced the proportional electricity-intensiveness of the gross national product (GNP) by almost 10 percent. Japan has doubled the GNP while increasing energy consumption by only 7-8 percent. In the USSR by 1990 it is intended to reduce the energy-intensiveness of the national income by 7-9 percent and metal-intensiveness by 13-15 percent, and by the year 2000--by factors of approximately 1.4 and 1.0, respectively. A task has been set to transform resource-saving into a decisive source of satisfying the growing needs of the national economy within 15 years: 75-80 percent of the increase in demand for fuel, energy, raw materials and processed materials will be satisfied because of savings.

The concept of solving the raw material problems. A typical feature of postwar decades has been the rapid growth of the extraction and consumption of mineral raw material. During the 1950's-1970's the world consumed as much raw material as it had during the entire preceding history of mankind. During these years we got the idea that a stable rate of economic growth was inseparably linked to accelerated development of the mineral raw material base. Striving to relieve ourselves and our allies of foreign dependency, we increased the volume of extraction and processing of useful minerals at exceptionally high rates. While in the world the production of mineral raw material doubled during 10 years, in the USSR it doubled in 2-10 years. As a result, today the Soviet Union accounts for 26 percent of the world output from the mining industries.

The increasingly large scale of extraction of useful minerals led to the exhaustion of the richest and most accessible ore deposits. Hence the increased cost of extracting raw material and the reduced effectiveness of public production. During the past 10 years expenditures on the extraction of 1 ton of petroleum in the USSR have increased by a factor of more than 1.7, fuel--by a factor of 5, and expenditures on the extraction of iron ore since the start of the 1960's have increased by a factor of 3. Large volumes of capital resources invested in branches of the extraction industry make structural changes difficult.

Two trends become clear in the provision of raw material: the development of conventional production and the development of new construction materials.

Regenerational production (repeated utilization of wastes) makes it possible to destroy the ever-increasing quantity of wastes and overcome the shortage of raw material resources. The production of aluminum, steel and paper from secondary raw materials saves approximately 90, 60 and 70 percent of the energy, respectively, as compared to producing them from primary raw material.

Regenerational production has been developing actively in recent years. In the middle of the 1970's 50 percent of the world production of nickel and silver came from secondary raw material, as did 35 percent of the copper and



steel and 20 percent of the aluminum. At the present time in Japan almost half of all the newspaper is manufactured from it. In the GDR 75 percent of the steel, 7 percent of the copper and 40 percent of the iron are melted from scrap metal and the collection of scrap paper covers about 45 percent of the country's need for raw material for the cardboard and paper industry. During the past 10 years as a result of various technical and economic measures the United States has reduced the proportional material intensiveness of the GNP by 20 percent and the metal-intensiveness by 16 percent.

In our country's raw material balance secondary resources comprise only 1 percent so far. A considerable proportion of the scrap metal is simply lost, for example, scrap copper--more than two-thirds, and scrap aluminum--even more. The establishment of regenerational production in the world began in the middle of the 1960's and now we need the most energetic measures in order to make up for lost time. At the July (1986) Plenum of the CPSU Central Committee it was emphasized that we have reached a point beyond which such inefficiency is not only intolerable but even impossible. It is necessary to reach a point where the fulfillment of assignments for economizing on resources and the level of their utilization becomes one of the major criteria for evaluating the work of each enterprise and collective. A task has been set under the 12th Five-Year Plan to satisfy 65-70 percent of the additional need for fuel and raw material and for certain kinds of it all of the additional need as a result of savings. In 1990 along the utilization of secondary resources will make it possible to release primary raw materials, processed materials and fuel valued at 40 billion rubles. Under the current five-year plan it is expected that more than one-fourth of the increase in the national income will be achieved as a result of resource-saving. Solving these problems will require shifting priorities in the distribution of allocations from geological research and the extraction industry to regeneration technology.

An analysis of the processes taking place in the world shows that wastes are becoming an increasingly essential part of the natural resources and their utilization is one of the most important tasks. Mankind is moving toward an economy of "repeated utilization of resources," in which wastes and garbage are becoming one of the major raw materials and natural supplies will play the role of a reserve source of supply. It is also necessary to take into account the specific circumstances of the next 2 decades. The mass breakdown of the old production apparatus and the application of principally new technologies will probably significantly reduce the demand for mineral raw materials. It cannot be ruled out, for example, that the world market for scrap metal for a certain amount of time will put the market for iron ore "out of the game."

A typical feature of the modern stage of scientific and technical progress is a development of new and the improvement of existing construction materials. The amounts of financing for this work are indicative. In the United States the private sector is spending \$4 billion on the development and improvement of these materials and in the federal budget is about \$1 billion. It should be noted that in those branches of industry where the quality and durability characteristics play an extremely important role expenditures on scientific research and development on materials comprise a significant proportion. Thus at the beginning of the 1980's in the U.S. automotive industry 30 percent of

the expenditures were used for this research, in the aerospace industry--36 percent, in the electronic industry--more than 40 percent, in the production of means of communication--41 percent, and in the chemical industry--55 percent.

The development of new and the improvement of existing construction materials today is acquiring greater significance in the search for new minerals since here exceptionally broad prospects are opened up for solving the raw material problem. Among the new materials one can note the fiber light conductors that are alloyed with various elements that make it possible to operate with extremely small optical losses. They provide for immense handling capacity for simultaneous telephone conversations and transmission of information. Composition materials are crowding out aluminum and replacing copper, cobalt and titanium. The role of powder metallurgy is increasing, and in many areas ceramics are replacing metals.

The style of life, as was noted in the political report of the CPSU Central Committee to the 27th Party Congress, cannot be changed immediately. But it is also impossible to wait. The course toward acceleration, unfortunately, is still opposed by a "swollen, inert and viscous mass of complacency." In order to fight against it it is necessary both to establish a new awareness and to carry out a purposive organizational restructuring, which would make it possible:

to discover and more actively advance energetic, creative workers (apparently it is necessary to change over more decisively to competitions and elections of leaders of production subdivisions);

to give space for the action of the forces of initiative (this presupposes an extreme reduction of indicators of directive planning and a changeover to planning on the basis of a portfolio of orders).

The control of socioeconomic development is becoming much more complicated under the new conditions. There is a corresponding increase in the requirements place on economic theory. In the political economy of socialism it will be necessary to depart from the established positions of the so-called normative direction. Its representatives are devoting most of their attention to a description of the patterns of the construction of socialist production relations in "pure form." Yet they leave to the side extremely crucial issues: why real socialism is distinguished from its normative, which impedes realizing the potential of our system and how does one regard on a theoretical level the new course which makes it possible to resolve many critical problems?

It seems that it is necessary to put in the foreground work in the new direction--the problem school. This regards the construction of socialism as a complex process of the development of productive forces, steadily advancing to their level the forms of realization of production relations and the establishment of a new consciousness. The initial stage in research is the disclosure of the root problems and the main difficulties production will encounter. A comparison of experience with theoretical normatives serve as a basis for adjusting the normatives themselves and determining alternatives for

the development of a new course for the socioeconomic policy. As was emphasized at the 27th Party Congress, the only scientific directions that are viable are those which depart from practice and return to it enriched by profound and effective recommendations.

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## RELATIVE MERITS OF MACHINE TOOLS DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 131-142

[Article by A. N. Popov, candidate of economic sciences, senior scientific associate of the Chelyabinsk Laboratory for Comprehensive Economic Research of the Institute of Economics of the Ural Scientific Center of the USSR Academy of Sciences: "Problems of Increasing Shift Work"; first two paragraphs EKO introduction]

[Text] The Basic Directions for the Economic and Social Development of the USSR During 1986-1990 and the Period Up to Year 2000 adopted by the 27th CPSU Congress set the following task: "To improve the utilization of fixed production capital, to provide for full loading of capacities and equipment, and to achieve an increase in output-capital ratio."

How does one best load equipment?

What must be done in order for there to be no idle machine tools? We offer articles on this subject for the readers' attention.

The tendency toward reducing the amount of shift work of machine tools and machines that has developed at many enterprises shows the existence of a serious national economic problem. The low level of the coefficient of shift work exerts a negative influence on the rates of scientific and technical progress. Idle time of machine tools and machines prolongs the time period for recouping expenditures and requires additional capital investments in the active part of capital.

From our point of view the point of departure in increasing the coefficient work of equipment is the question of normative values. Without this the very concept of the "coefficient of shift work" sounds abstract to a certain degree. It seems to us that normatives should first of all stimulate more complete utilization of highly productive and costly technical equipment. In this connection, in our opinion, under modern conditions it would be expedient to calculate the coefficient of shift work taking into account the value of the equipment. For the average statistical unit of equipment it could even be reduced, but for more costly and productive equipment it should even increase. Practice shows the real possibility of bringing the level of shift work of costly equipment up to 2.



Associates of the Chelyabinsk Laboratory for Comprehensive Economic Research of the Institute of Economics of the Ural Scientific Center of the USSR Academy of Sciences have developed normatives for shift work of equipment that are differentiated according to its value. We proceeded from the idea that every ruble spent on the acquisition of any unit of metal-processing equipment should have the same level of return. According to our calculations, the coefficient of shift work of equipment with a value of from 50,000 to 100,000 rubles should be equal to 2, and more than 100,000 rubles--2.3.

Mechanization and automation of production lead to a tightening of the ties that join various kinds of equipment together in a unified technological process. But the possibilities of utilizing equipment on various shifts are not precluded since there are varying degrees of series production, and reconstruction and technical reequipment are frequently carried out without shutting down the shops.

Especially great possibilities of differentiating the loads of various groups and units of equipment exist within the large production and economic complexes. Yet the overall level of concentration of machine-building production is still inadequate. In Chelyabinsk Oblast it looks like this (Table 1).

Table 1--Overall Level of Concentration of Machine-Building Production in Chelyabinsk Oblast

Machine-Building Enterprises	Their Proportion		
	Of Overall No. of Enterprises	Of Gross Output	Of No. of Personnel
With production volume of more than 100 million rubles	0.5	33.4	25.9
Other enterprises within independent balances	16.7	63.4	68.4
Small machinebuilding enterprises of nonmachinebuilding branches	82.8	3.2	5.7

The figures in Table 1 show that the largest machinebuilding enterprises which comprise only 0.5 percent of all the plants, account for onethird of the products that are produced and onefourth of the industrial production personnel.

If at all machinebuilding enterprises with independent books labor productivity were equal to 10,600 rubles per man and the output-capital ratio were 1.23 rubles per ruble, including at enterprises of machine-building ministries--13,800 rubles per man and 1.56 rubles per ruble, then at small enterprises these figures would be 6,900 rubles per man and 1.05 rubles per ruble, respectively, and, as Table 1 shows, the small productions are in the majority. Hence the conclusion: it is necessary to concentrate machine-production distribute metal-processing equipment more efficiently among the branches of the national economy and to gradually reduce the amount of it outside of machine building (now about 47 percent of the units of metal-

processing equipment are installed in auxiliary services of non-machine-building plants (and at machine-building plants of non-machine-building ministries).

Based on the value of the technical equipment, we have calculated the normatives for shift work for the various kinds of equipment. The greatest amount is found in forge-press equipment--2.26 shifts, including in basic production--2.09 and in auxiliary production--2.43 shifts. Next come the normatives for electric welding machines (1.93), metal-cutting machine tools (1.76) and casting equipment (1.71).

A comparison of the normatives with the actual level of the coefficient of shift work calculated taking into account the value of the equipment shows the existence of significant reserves for better utilization of fixed production capital in machine building.

At the forge and press plants of the ChTZ imeni V. I. Lenin the automotive mechanics plant has a larger share of progressive and costly equipment than any of the plants given in the table do. But its utilization on different shifts and assimilation in production are being prolonged, and therefore the actual level of shift work is lower than the normative (Table 2).

Table 2--Normatives (Taking Value of Equipment Into Account) and Actual Level of Coefficient of Shift Work of Metal-Processing Equipment

Association (Plant)	Coefficient of Shift Work	
	Actual	Normative
Forge-press	2.01	1.69
ChTZ imeni V. I. Lenin	1.86	1.60
Automotive mechanics	1.84	1.57
Technical fittings	1.42	1.28
Strommashina	1.40	1.30
Automotive tractor trailers	1.34	1.47
Instrument	1.32	1.36
Road machinery	1.28	1.40

The normative level is low at the instrument, road machinery, and automotive tractor trailer plants and Chelyabzhivmash since the group of progressive equipment is extremely small in quantity. Thus the road machinery plant has only 17 machine tools with numerical program control and they are utilized with a coefficient of shift work of 1.1. The overall high level of actual shift work as compared to the normative shows that other groups of equipment are used with a load that exceeds the corresponding normatives (taking into account the value of the equipment). The picture is approximately the same at the other enterprises. This tendency has a negative character since a large quantity of labor force is diverted for servicing less productive equipment. And as a result there is a shortage of personnel. The road machinery plant at the present time is short 32 machine tool operators, 12 mechanic-repairmen, and 47 electrical equipment installers.

According to one of the methods for calculating the coefficient of shift work applied in machine building, the declared number of machine tool operators is compared with the average listed quantity of installed equipment. But at enterprises there are groups of machine tools that are adjusted for a single operation where personnel run more than one machine tool. These machine tools are not readjusted for a long time and a certain quantity of labor force is saved (for example, at the Plant imeni Kolyushchenko). The machine tool operators work on several machine tools. When there are reserve capacities this kind of combined service of technical equipment is largely justified. But then the level of shift work of the technical equipment is artificially increased and its intrashift utilization deteriorates.

In the Ministry of the Shipbuilding Industry, along with normatives for shift work of equipment they have developed normatives for intrashift utilization. In their totality these indicators determine the coefficient of loading of machine tools and machines (Kzag):

$$Kzag = Kgm/P \times Kvn = Ksm/P \times Kts \times Kup$$

where Kvn--coefficient of intrashift utilization of machine tools and machines, Kts--coefficient of technological structure of equipment, Kup--coefficient of production conditions, P--schedule for operation of equipment (usually--two shifts).

It would be expedient for all other branches of machine building to do this same work. Otherwise it would hardly be possible to count on having normatives of shift work play an active role in raising the level of the utilization of capital.

When speaking about calculating normatives and planning it is expedient to note one more important aspect. According to reports, at any given machine-building enterprise the production capacities are utilized by 95-98 percent, and sometimes 100 percent. But the shift work of the installed equipment can vary greatly. Take, for example, the Chelyabinsk Instrument Plant. The production capacities here are utilized by 97 percent, and the coefficient of shift work of machine tools and machines is 1.3. This can be explained by the fact that the production capacities have been calculated with 42.2 percent of the equipment assigned to the given enterprise. The rest of the machine tools and machines are in auxiliary shops (19.7 percent), auxiliary productions of the main shops (21.1 percent) and in the group of technical equipment that is called batching equipment or special equipment (17 percent) for the basic shops. It is utilized relatively rarely, but without it the process of production of the products assigned to the given enterprise is impossible.

One would think that when calculating the production capacity one should take into account all equipment included in the basic production of the basic shops. In the instrument plant this amounts to 59.2 percent of all that is installed. Otherwise the plant will always have a high level of utilization of production capacities with a low level of loading of the basic means of labor.

Frequently the existence of reserves of equipment is advantageous for the administration of enterprises. In the first place, there is the possibility of production maneuvering (relocation of machine tools to the reserve when they break down). Second, there are fewer problems with machine tool operators who prefer to work on the first shift.

An investigation conducted in May 1984 at plants of Chelyabinsk showed that here they have a large quantity of surplus of equipment. During the working day the road machinery plant usually does not utilize more than 21 percent of the machine tools and machines. Thus, for example, in Shop No. 2, 15 units are unnecessary in the opinion of the shop chief, or 7.6 percent of the equipment installed there.

Advanced practice shows that new, highly productive technical equipment should be utilized on two full shifts, and the operation of flexible automated complexes that include, in addition to metal-processing equipment, electronic computer equipment, means of transportation and robots, are effective only with three-shift operation and a continuous work schedule. EKO has written about this [Footnote 1].

Problems related to improving the structure of the fleet of equipment, carrying out technical reequipment of enterprises, introducing new technological processes and utilizing robots and manipulators are especially crucial. As our investigation showed, this work is clearly in need of improvement. For example, workers of the division for mechanization and automation of production of the road machinery plant referred to the fact that their orders for new technical equipment are satisfied by only 15-20 percent. In their opinion, as a result of this, scientific and technical progress is held up and the shortage of labor force is relatively great. A different picture is drawn by workers of the bureau for equipment that is included in the plant's capital construction division. They think that orders for new technical equipment are filled completely within the limits of the capital investments for equipment and construction allotted by the ministry, but the head technologist's division each year orders too large a list of equipment.

Thus one can see a lack of coordination of actions and the absence of a unified approach to the problem of technical reequipment. The Ministry of Construction, Road, and Municipal Machine Building, which has jurisdiction over this plant, has interesting experience in calculating the optimized production program for each year for all of the enterprises under its jurisdiction. The program includes the following sections: the assortment and volume of output of products, the calculation of the utilization of equipment for the optimized production program, and the number of basic production workers in the various occupations.

The second section of the program is of the greatest interest. It lists all types of installed equipment, indicates its figures, and gives the number of machine-tool hours: actual, consumed, surplus, shortage. The coefficient of loading is calculated for each type of equipment. At the Chelyabinsk Road Machinery Plant, for example, it is 0.58.



The optimized production program, in our opinion, can be the basis for substantiating the orders for new equipment.

In the modern stage of development of the economy there is a need to change over from the creation and utilization of individual kinds of technical equipment to sets of technologically coordinated machines, which was discussed at the April Plenum (1985) of the CPSU Central Committee and the June Conference (1985) of the CPSU Central Committee on acceleration of scientific and technical progress. It is also necessary to change over to a system of sequential comprehensive supply of enterprises with new technical equipment.

A large role in increasing the loading of machine tools and machines is to be played by the repair services of the enterprises. For many years at the majority of enterprises the plans for reducing the number of workers were fulfilled basically by reducing the number of repair workers. Thus at the repair-mechanics shop (RMTs) of the Chelyabinsk Tractor Plant the number of workers has decreased by 40 percent from 1962 up till the present. The number of machine tools here exceeds the number of workers by 41 percent. In addition to reducing the coefficient of shift work in the repair service to 1.22, this has led to a shortage of spare parts and a reduction of efficiency in the repair of equipment. And, as a result, the effectiveness of the utilization of equipment in the basic production has decreased.

At the present time the repair services are basically decentralized among the shops. The repair-mechanics shops of the plants included in the ChTZ Association and the repair-mechanics workshops perform only 8 percent of the volume of capital and medium-term repairs of equipment and manufacture 45 percent of the spare parts, and the rest of the repair work is done in repair subdivisions of the shops that are being served.

In order to increase the effectiveness of the work of the repair service, this association has developed and is introducing the "Comprehensive System for Control of the Repair-Mechanics Production." In addition to increasing the labor productivity of the repair workers, its introduction will make it possible to improve the utilization of equipment both in repair and in basic production. When developing the comprehensive system they studied the experience of large plants in the country (I have in mind such machine-building giants as VAZ, ZIL, GAZ, the Minsk Tractor Plant and others). On the basis of analysis they determined the level of centralization of repair services that was most acceptable for the association. The repair-mechanics shop of the head plant is being transformed into a repair plant. It will perform most of the work for capital and medium-term repair of equipment. Additionally, repair shops of branch plants and large productions are also specializing in this form of work. Shop repair services will provide service between repairs and repair of simple equipment. As a result of raising the level of centralization, the fleet of machine tool equipment in the repair service will decrease by 12 percent.

Significant reserves for increasing the effectiveness of the utilization of machine tools and machines lie in improving the material and technical support for repair needs (ball bearings, V-belts, Textolite, paint and other materials). Managers of supply organizations now state frankly that the needs

of repair are the last to be considered. The lack of provision of materials and purchased items leads to a situation where the idle time of equipment increases and the coefficient of shift work decreases.

The investigation conducted by our laboratory showed that a weak spot at machine-building plants is the organization of accounting for shift work of machine tools and machines. According to information from the division of the head technologist of the road machinery plant, for example, a semi-automated eight-spindle Bulord lathe operates 10 hours a day with a coefficient of shift work equal to 1.4. But the chief of the shop in which this machine tool, valued at 192,000 rubles, was installed, gave data according to which the Bulord works only 2.4 hours a day.

At the Chelyabinsk Instrument Plant the statistical data for two kinds of calculation of the coefficient of shift work are extremely different. Thus according to one-time investigations conducted by the USSR Central Statistical Administration, the amount of the coefficient of shift work here ranges from 1.24 to 1.30. But when the coefficient is calculated according to the ministry's instructions, its level is higher--1.54.

The differences in the shift work are determined by a number of factors. First, the ministry's instructions recommend not including in the report equipment that is intended for production training or that which is assigned to workers and utilized for auxiliary operations either (grinding stones, emeries, and others). Second, the actual labor-intensiveness of the manufacture of products is usually less than that envisioned when calculating capacities. Third, the distortion is brought about by overtime work, which exists at the plant because of the low level of rhythm of production. The list of equipment which is recommended not to be included when calculating the coefficient of shift work includes about 20 percent of the machine tools and machines installed in the instrument plant.

Consequently, improvement of accounting for shift work is one more important condition for improving the utilization of equipment.

What has been said emphasizes once again that the reserves for better utilization of metal-processing equipment are fairly significant. At the same time at many plants there are so-called "bottlenecks." Therefore, it would be advantageous for enterprises to cooperate in certain kinds of work. Improvement of the utilization of less loaded machine tools and machines could be placed on a planning basis and a "reserve bank" could be created which would be run by a special coordination center.

In 1984 the economics division of the CPSU obkom sent out to managers of a number of enterprises of the city of Chelyabinsk questionnaires asking them their opinion about this issue. Interesting responses were received. At the road machinery plant, for example, there are reserve capacities on a number of machine tools of the milling, drilling and polishing groups. And at the same time the lathe group is overloaded. Cooperation in processes of metal processing would be advantageous to the enterprise.

Cooperation exists to a certain degree even now. But in the majority of cases this work is carried out unsystematically, without general coordination, and sometimes it is not approved by branch agencies. For instance, the metal structure plant makes blank pieces for bulldozers for other enterprises and hoods for repairing blast furnaces. The assistance is useful and necessary. But the plant is forced to conceal its nonplanned work, since the ministry does not always support it.

Not all executives approve of the idea of creating a "reserve bank." Skeptics think that with the existing system of planning it will not be viable. In our opinion, the fear is invented. For the cooperation will be based on mutually advantageous interests and, additionally, the clear advantage to the entire national economy. The introduction of this system will make it possible to sharply increase the return from existing equipment and will expand the technological capabilities of a number of enterprises when assimilating new kinds of products, and without additional capital investments.

As we can see from what has been said, increasing the coefficient of shift work equipment depends on many factors. But one should especially emphasize the role of the human factor. When two-shift work is organized it is necessary to create equal social-domestic and general city conditions for the workers. It is necessary to rearrange the schedules of urban transportation, the order of the day in children's preschool institutions and public catering enterprises, and so forth.

The "price" of the second shift at the present time is very high. It is precisely during the evening hours that people obtain the maximum social benefits. They meet with members of their family, go to the theater, engage in sports and so forth. Therefore the wages of workers on the various shifts should be higher than those for workers who work only on the first shift. Another variant of incentive is to increase the regular vacation by 2-3 days. This, of course, does not exhaust the possibilities of solving social problems with the organization of two- and three-shift work. There are many other paths. And they should be utilized, because the success of any cause is finally determined by the people.

#### FOOTNOTE

1. "The GAP--A New Branch of Automation," EKO, No 3, 1985.

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## LONGER OPERATION OF EQUIPMENT URGED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 142-148

[Article by A. A. Voronov, candidate of economic sciences, Krasnodar State University: "Reserves for Loading Equipment"]

[Text] Today's Load

In spite of a number of measures that have been taken recently the responsibility and interest of the enterprises in the maximum possible utilization of machine tools and machines has practically not increased. At home, in daily life nobody would think about operating several vacuum cleaners, television sets, washing machines and so forth at the same time. Here the number of implements of labor is determined simply by the rational need for them! But in industry, even if it is not all of them, a considerable proportion of the managers and leading specialists of enterprises are exhibiting a desire to maintain the machine tools "in any case." Downtime of equipment at enterprises within the shift and throughout the shift at the present time amount to 20-30 percent, the coefficient of loading in time rarely exceeds 0.7, and in the majority of cases the coefficient of shift work ranges from 1.3 to 1.4.

The picture is practically the same in all regions of the country. In Krasnodar Kray, for example, according to data of an investigation conducted by the Kray Statistical Administration on 15 May 1984, on an average for all the machine-building plants that were investigated the coefficient of shift work was 1.32 (somewhat higher than during preceding years: in 1980--1.12; in 1982--1.26 and in 1983--1.27, but it is still clearly inadequate). And the average coefficient of loading of equipment on the basis of investigations conducted in 1981 was equal to only 0.62. In other words, one might say that more than one-third of the machine tool fleet in the kray was completely unused. And a comparison of the labor-intensiveness of the production programs and the fleet of installed equipment showed that at the enterprises that were investigated, even with the organization of two-shift work, more than 2,000 machine tools and machines would be generally surplus!

In individual enterprises (at the Krasnodar Kuban Mechanics Plant, the Tuapsi Machine-Building Plant imeni XI Godovshchina Oktyabrskoy Revolyutsii and so



forth) the equipment with two-shift operation was loaded by little more than one-third of the scheduled supply of time, and in the cross-section of individual technological groups, in some places it was even less than 10 percent.

The increase in deductions from profit for improving the utilization of technological equipment is practically unfelt. In exactly the same way, the amounts of bonuses for individual workers and services that depend on it in direct proportion are also practically unfelt. At the same time, the risk of being given an administrative reprimand and being deprived of a bonus because of a failure to fulfill the plan and many other factors does not motivate the managers of enterprises and organizations to adopt more difficult plans for producing products using the same production capacities.

The low level of the coefficients of shift work and loading of technical equipment predictably lead to a regular reduction of the output-capital ratio. Thus in 1980 the output-capital ratio in industry and Krasnodar Kray was only 90.9 percent of the amount of this indicator in 1975, and in 1985 it was only 87.21 percent of the level in 1980. In a number of branches, the decline of the output-capital ratio was even greater. In machine building and metal processing, at all enterprises of the kray there was an average decline of the output-capital ratio during the 10th Five-Year Plan of 11.2 percent (in terms of the complete value of the capital) and 18.5 percent (in terms of the active part of the capital). Unfortunately, this tendency continued under the 11th Five-Year Plan as well. In 1985 as compared to 1975 on the whole it had dropped by 19.5 percent. During this period the return from the active part of fixed capital decreased in practically the same proportions.

The decline in the output-capital ratio reduced the possibilities of increasing the output of products by industry and the kray under the 11th Five-Year Plan by 1.751 billion rubles, including in machine-building and metal processing--by 220 million rubles.

What factors cause the low level of coefficients of shift work and loading of equipment during recent decades and creative prerequisites for the decline of the output-capital ratio? First of all there was the lack of correspondence between the structure of the machine capacities of the production programs and the fleets of technological equipment at the majority of enterprises and associations. Considerable disproportions were revealed which were brought about by the existence of surplus equipment in excess of any reasonable normative reserves (the need for which nobody will deny). The situation was exacerbated also by the fact that there is a lot of worn-out and obsolete, less productive equipment whose application impedes the growth of labor productivity.

The next factor is the inadequate level of specialization of production and the low degree of series production of the products that are produced. Because of this it is necessary to have equipment of many type sizes which is rarely used. And there is practically no cooperation in loading equipment among enterprises in the regions.

Methods of measuring, norm-setting and accounting for the real loading of equipment are extremely imperfect. The existing reporting on the utilization of equipment at enterprises is arranged on periodic investigations by agencies of the central statistical administration of the shift work of machine tools and machines. And the shortcomings and the methods of conducting these investigations are generally known. The coefficient of loading in time is not determined at all, even during these rare investigations.

Yet in order to solve a whole number of the most important national economic problems (such as the organization of regional interplant cooperation in the utilization of production capacities, the utilization of reserves of equipment at enterprises for increasing the output of consumer goods and so forth), there has long been a critical need to know precisely at any moment of the planned period the loading of technical equipment and the reserves of machine time for the fleet of machine tools and machines of the enterprises; in the cross-section of individual technologically homogeneous groups; and in the cross-section of individual types of equipment. In our opinion, the average coefficient of loading of machine tools and machines for the enterprise should be a mandatory directive and annually confirmed indicator.

In past years, the main efforts of economists have been directed toward research on methods for calculating, planning and evaluating the level of the utilization of production capacities and equipment at the enterprises; methods of determining the need for equipment and the organization of its delivery; economic and mathematical modeling of the optimization of production programs and loading of equipment; tendencies, factors and causes of changes and indicators of loading of equipment; and methods of accounting for the actual loading of equipment in time. Much less study was devoted to questions of forming the normatives and stimulating effective loading of machine tools and machines at industrial enterprises.

With the exception of the Sumy Production Machine-Building Association (men) M. V. Frunze, whose experience has been described in relative detail in economic literature (Footnote 1), including in the magazine EKO (Footnote 2), the country has almost no publications that give more or less substantiated recommendations regarding this subject. Questions of cooperation in loading equipment have almost not been reflected in literature either.

At the present time, several dozens of various models of optimization of production programs are known and have been described in the literature. But they have never been applied on any broad scale in the plant practice of planning, even in spite of the fact that the need for their application when preparing drafts of five-year plans has been confirmed in such an authoritative document as the standard methods of the USSR Gosplan.

When analyzing the applicability of economic and mathematical models, Academician M. P. Fedorenko pointed out that "the publicity of economic and mathematical methods among management personnel is being conducted timidly," that "as soon as it comes to the utilization of the model calculations for the development of plans itself the situation changes sharply; the more effective and, consequently, the more difficult the plan, the more difficult it is to carry out and the managers of the enterprises know this." (Footnote 3)

But there are a number of serious justifications for giving one more reason for the clearly inadequate scale of the introduction of economic and mathematical methods and computers into the practice of planning, namely the unwieldiness of many of the proposed methods and models of optimization. We need models and methods that are simpler and more comprehensible.

#### Conditions for Increasing Loading

Undoubtedly, the main question is how to interest managers of enterprises and organizations in adopting more difficult plans that have been developed on the basis of optimization of the loading of equipment (and, consequently, have been calculated for complete utilization of production reserves). In order to neutralize the "alarming" tendencies, as Academician N. P. Fedorenko called them, it is quite necessary, in our opinion:

to introduce 5-10-fold payment as compared to the ordinary payment for that part of the technological equipment which after verification calculations of the Central Statistical Administration are regarded as surplus;

to introduce during the years of the 12th Five-Year Plan bonuses in the amount of 2 or 3 months salaries for the results of the year for the directors, head economists, chiefs of planning divisions and chiefs of divisions for automated systems for control of the production of enterprises for promptly submitting to the ministry plans of optimal production programs that have been calculated on computers and accepted as directive planned assignments.

If the enterprises do not carry out optimization calculations and do not plan measures for improving the utilization of equipment and increasing the output of products without additional capital investments, their material incentive fund should be reduced in proportion to the concealed reserves. Perhaps the sum of the collective reduction of bonuses should be completely or partially transferred into the running account of the control agency for special bonuses for workers who do carry out the calculations for verifying the utilization of production capacities at the given enterprises.

In these cases, in our opinion, it would be completely justified to have one-time application of administrative measures for influencing those who conceal reserves of production capacities--analogous to the existing responsibility for failure to fulfill volume indicators of the technical industrial and financial plan.

Along with this, there has arisen a need to introduce both intraplant forms of accounting for the actual loading and shift work of technological equipment and forms of statistical accounting for the central statistical administration, which envision the collection of information on these indicators in the cross-section of individual homogeneous groups of machine tools and machines.

The small increase in the labor-intensiveness of accounting work at enterprises resulting from the introduction of this form (approximately 5-7 man-days a month at small and medium-sized plants and 10-12 man-days at large

ones) is more than compensated for by the efficient disclosure of the possibilities for increasing the output of products without additional capital investments.

#### Cooperation in Loading Machine Tools and Machines: Is It Possible?

Accounting everywhere for the loading of equipment will make it possible to directly approach the organization of interplant cooperation in the utilization of machine tools and machines in various regions of the country. In order to create a system for such cooperation, in our opinion, it would be necessary: to determine the reserves and the shortage of machine time at enterprises and associations of the regions and to formulate efficient plans for such cooperation. Of course it is necessary to create a clear-cut legal basis for carrying out the cooperation and to develop a system of efficient and reliable information in order to notify managers of enterprises of the availability of reserve capacities at neighboring enterprises and associations. One must not forget about the stage of organizational "conjunction" of the enterprises among themselves--for operations in the loading of machine tools and machines--and, finally, the stage of development of the complex of moral and material incentives for participation and cooperation.

As the small amount of experience in cooperation in Krasnodar Kray has shown, it is necessary to create a permanent group which will engage exclusively in this problem for 1.5-2 years. In our opinion, the group should include: a scientific leader, an economist, a specialist in the area of analysis of the effectiveness of the utilization of fixed capital, production capacities and equipment; specialists in operational calendar planning; skilled mechanics and a technologist; and one or two technical workers.

On the basis of initial data concerning the composition of equipment, the normative proportional machine-intensiveness of products, the shift schedule for operation of the enterprise, losses of time for repair and adjustment, coefficients of overfulfillment of the norms and so forth one calculates the coefficients of loading of machine tools and machines (for the enterprise as a whole and the cross-section of individual technologically homogeneous groups) and the reserves (shortage) of machine time with one-, two- and three-shift work.

The final selection of a system for cooperation is the culmination of the procedure of drawing up the balance of surpluses and shortages of machine time (in the cross-section of individual technological groups) on the whole for all enterprises of the region. Of course, one cannot forget about the difficulties in organizing the juncture of enterprises--the departmental separation will undoubtedly have its effect. This must be kept in mind. It is important to arrange a system of regular notification of participants in cooperation concerning the availability of reserve capacities (for example, the publication of a special bulletin).

How realistic is it to organize this kind of cooperation? Under the conditions of departmental separation and the lack of the proper interest on the part of managers of enterprises in a high level of coefficient of loading



of equipment, undoubtedly, it will be difficult to carry out. But with the introduction of sufficiently high normatives and the establishment of normatives of deductions into the material incentive funds depending on the actual results of cooperation, the probability of success increases sharply. Moreover, in foreign countries (the United States, Switzerland, the GDR and other countries) the so-called leasing has proven itself and become widespread--this is temporary rental of equipment not used by the owner. There is reason to think that this form of intensification of the utilization of equipment will be justified in our country as well.

Carrying out the indicated measures completely will make it possible to improve the utilization of machine tools and machines and, on the basis of this, without additional capital investments, to increase the output of products by 15-20 percent (including the output of consumer goods and so forth).

#### FOOTNOTES

1. Moskalenko, V. P., "Otsenka i stimulirovaniye napryazhennykh planov predpriyatiy (Opyt sumskogo mashinostroitel'nogo zavoda imeni Frunze)" [Evaluation and Stimulation of Taut Plans of Enterprises (Experience of the Sumy Machine-Building Plant imeni Frunze)], Moscow, "Ekonomika", 1976.
2. See EKO, No 12, 1979.
3. Fedorenko, M. P., "Economic and Mathematical Models and Methods," EKONOMICHESKAYA GAZETA, No 1, 1985, p. 15.

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## AGE OF EQUIPMENT COUNTS IN CAPITAL TAXES

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 149-150

[Article by A. P. Markin, candidate of economic sciences, Ryazan Radio Technical Institute: "Paying for Capital Taking Age of Equipment Into Account"]

[Text] Statistics have adopted a special form in which accounting for the age of equipment is done according to three gradations: up to 10 years, from 10 to 20 years, and more than 20 years. With this form of accounting, it is difficult to determine which quantity of equipment will next year be included in the outdated equipment, that is, more than 20 years old, since the interval (10-20 years) includes, in addition to young equipment (10-12 years), medium-aged equipment (13-16 years), equipment which is on its way to being outdated (17-20 years). And this is the kind that requires especially constant attention from managers of enterprises since within a relatively short period of time it will have to be replaced or modernized.

For more precise accounting for the age composition of equipment and industrial enterprises an accounting form has been suggested with a breakdown into five groups: up to 10 years; 10-12 years; 13-16 years; 17-20 years and more than 20 years, and the equipment has been grouped within the interval of 10-20 years at machine-building enterprises of Ryazan.

It is clear that the distribution of equipment among the age gradations within the interval of 10-20 years can be extremely irregular. Thus the majority of planers and hammers are within the limits of obsolete equipment. Thus within 3-4 years about 50 percent of all equipment within the interval of 10-20 years, that is, that group which is not yet causing any concern from the management of the enterprise, will move into the category of being obsolete.

In our opinion, there is now a need to improve the payment for capital by differentiating it depending on the age composition. The differentiation of the payment for capital depending on its age places enterprises that use both new and obsolete equipment in the production process in an equal position.

Age Composition	% of Calculated Sum of Payment for Fixed Capital
Equipment up to 10 years	100
Equipment from 10 to 12 years	90
Equipment from 13 to 16 years	80
Equipment from 17 to 20 years	70
Equipment more than 20 years	50

Two machine-building enterprises have mechanics shops with identical capacities. Installed in the mechanics shop of the first enterprise are 50 units of relatively young metal-cutting equipment with an overall balance value of 250,000 rubles. In the mechanics shop of the second enterprise, there are 80 units of obsolete metal-cutting equipment with an overall balance value of 450,000 rubles. With the existing policy for making payments for capital, the first enterprise will pay 15,000 rubles and the second--27,000 rubles.

Thus the second enterprise ends up in worse financial conditions by paying a large sum of money for fixed capital.

We suggest the following differentiation of payment for fixed capital depending on its age composition.

Kind of Equipment	Age Composition		
	10-12 years	13-16 years	17-20 years
Planers	23.2	28.4	48.4
Vertical lathes	16.6	55.1	30.3
Hammers	17.8	30.9	51.3

The calculation of the payment for fixed capital taking into account its age composition greatly increases the volume of accounting work and also places in equal positions collectives of industrial enterprises that, because of objective factors, use both new and obsolete equipment.

A rebate in the payment for obsolete equipment is not an impediment to updating it and will not reduce the interest of the enterprises in more effective utilization of fixed capital, since the amount of the rebate will not make up for those immense losses of live and embodied labor which take place with the operation of obsolete equipment.

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## FOREMAN LOSES ENTHUSIASM FOR CHANGE

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 151-157

[Article by Yu. V. Bychkov, foreman: "How I Became a Conservative"]

[Text] A year ago the brigade leader came to me and said that one hammer in our section was not placed correctly. It had to be turned 180 degrees. Then in the section it was possible to place a conveyor on which hot blank pieces would be delivered from the furnace to the hammer. The brigade leader had already calculated that expenditures on moving the hammer and acquiring and installing the conveyor would be recouped in a half-year. Because labor productivity would increase and the production cost of the manufactured parts would decrease. The brigade leader added that his brigade was prepared to participate in the modernization of the section. He had discussed this several years ago with the foremen and the chief of the shop. They all liked his idea. But they had not done anything about it.

I also became "impassioned" with this idea. And I did not do anything either....

And yet when I began to work in this section I was resolute. When I first came here, about 2 years ago, I immediately noticed that the ventilation was not very good here, it was too noisy, the blank pieces and scraps of metal were lying on the floor, the containers were scattered in a disorderly manner, almost all the equipment was old and dirty and the paint was cracking. And the work clothes of the forge operators could have been a little tidier....

Initially I looked attentively at everything and delved into everything. At that time a brigade leader and efficiency expert came up to me made hopeful by my clear and active interest. I had both enthusiasm and a desire to improve and update everything in the section. I was confident that I could do this. The more so since the shop chief and the senior foreman promised to help me.

At that time it seemed to me that the most difficult thing in the work of a foreman was to find an approach to each subordinate and involve him in the work. But very soon, having seen what all of the foremen in the section were doing, I understood that I was mistaken and that in general my ideas about production, which were drawn from VUZ textbooks, were far from reality. In



general, the foremen do not "look for an approach" to anybody and do not "involve" anybody. They do not have time for that. They are busy preparing for production and making sure that the equipment operates continuously. All thoughts and all efforts are concentrated on this. All their work time goes for this.

Let us take a detailed look at what I had to do during the course of a shift. I would arrive 15-20 minutes before the beginning of work. I would take out a journal in which the fulfillment of shift assignments was registered; I would look at how the preceding shift had worked, and what remarks had been made by its foreman. I would walk through the section and look and see where and what kinds of blank pieces and prepared parts were lying about. Then I would go to the next metallurgical shop and look and see which blank pieces had already been cut for us and which would be cut. Here I would measure the diameters of the rods on the shelves, look at the marking of each kind of metal, and write everything down on a notepad. I would return to the office of my section. I would open the file entitled "In Cutting," where there were blueprints of those parts for which we were to "cut" blank pieces in our section today. I would remember where I had seen the blank pieces that were already cut. Then I would figure out on which equipment these parts should be made....

During that time the workers would gather in the office. I would look to see who was late today. I would give the blueprints to the forge operators. Then I would go around my section, together with the transportation workers. I would point out the blank pieces and give an order to take them to certain equipment. The production process would begin in the section. And I would return to the office and go through my files looking for the blueprints of the parts. My desk was heaped with blueprints. They are given to our section all at once for the month. And each month there are up to 500 blueprints. The foremen tried so hard to put them in order and arrange them in their various files! But still our desk was flooded with "businesslike disorderliness," there were too many papers.... It was not without difficulty that I would find the necessary blueprints, checking them against the entries on the notepad that were made in the metallurgical section. On the plan-schedule I would look for the numbers of the parts in order to find out how many of them had to be made. And for each part I would write out little orders in which I would indicate the number of the part, the number of the item in which the part would go, the grade of metal, the diameter of the blank piece and its length, and the number of blank pieces. I would give the orders to the foreman of the metallurgical section. Again I would return to my office and write on the orders the number of the parts and then go to the norm setter for a rating. As I passed by, I would drop in on the planners and dispatchers. I would learn which parts had to be made first. I would ask the plant technologists if there were stamps for these parts and where they were located. Again, I would go through my section. I would give the workers the orders for the manufactured parts. I would check the sizes of those that have just been manufactured. I would give the order to the transportation workers and send the containers filled with parts to other equipment for further processing. At this time a new batch of metal would be sent to the metallurgical section. I had to run there. Metal is brought to us several times a day from the warehouse which is located at the other end of the city. We order metal ahead of time according to a certain policy, but it is

frequently not brought to us at all in the way we had planned. Therefore, in spite of the clear-cut monthly plan, we do not know what we will do in our section throughout the day....

Again I measured the diameters of the rods on the shelves, look at the grade of metal and so forth. That is, I repeat again, and then again, all the sequence of work described above. At the end of my shift I prepare work for the next shift....

Once a blacksmith was late for work. I reprimanded him and he responded to me: "If you yourself cannot organize production well, what are you asking of us? Now our hammer will stand idle for 10 minutes. The blank pieces have not been brought yet." And in fact if the hammer stands idle, what difference does it make if the worker is a minute or two late for his shift, if all he will do is sit there? And what moral right do I have to demand this kind of discipline from him?

The worker was not late anymore. But from this and other examples I am convinced that not very good organization of production is reflected in the psychological condition of the workers, their attitude toward product quality and their attitude toward their work. But am I not trying to do everything in order to improve the organization of labor? It is for this that I am beating my head against the wall and running around like a chicken with his head cut off.... It is precisely the idea that it is necessary to provide the blacksmiths with continuous work that keeps me in a state of constant stress. The blacksmiths demand (and precisely from me) continuous work because they have piece-rate-plus-bonus payment and idle time is not advantageous to them. But still there is idle time and the planned rhythm of deliveries for our products to other shops cannot be held up. For much is done urgently, unexpectedly, and not everything is thought out ahead of time....

A worker I know once said that if every individual would do his work conscientiously, there would be order everywhere. But what about the other foremen and I--do we really not have a conscientious attitude toward our work? I see how they work without sparing effort or health 9-11 hours a day. And at the end of the shift, even foremen with long service complain about fatigue. I myself feel extremely tired. My nerves are overstrained, I have had to handle a large flow of information. And the main thing is that I do not feel satisfaction. Even if the shift assignment has been fulfilled. For I still understand that I am "stuck" in the production process, I am not over it, but it is over me.... I lead the units of the technological chain and not the collective. I move among the sections, hammers, presses, blueprints, orders, blank pieces, parts--but I do not manage to check on the cleanliness of the workplaces and there is no time or effort for educating people or improving the conditions for their labor. And that is the way it is every day, from month to month. And then there appears in my section a space for inefficiency. Now I can already be called a conservative and an impediment to scientific and technical progress in the forge section. Because my work cannot be seen. The way the section was before I came is the way it remains. The brigade leader efficiency expert no longer reminds me of his proposal. And I do not remind the senior foreman or the shop chief of my intentions to update the section or their promises to help me in this....

But I still recall my previous plans and my conscience gnaws at me. And the suspicion becomes stronger that there is no point in my conscientious work because I am doing something that is not really my work.

What should I do next? Continue to work this way? And if I transfer many of my jobs related to the fulfillment of the current plan to the functional services of the shop, and I myself engage in a comprehensive improvement of the section? (Just work for improving working conditions here is an endless area.) I came to this idea when I became familiar with the "reference book for the foreman" (2nd ed., reprinted and augmented. Lenizdat, 1985. Authors--N. A. Aksenov, V. A. Volosatov et al.). In the section entitled "The Foreman: Rights, Functions and Requirements" I read: "...At a number of enterprises they have delimited the functions of the foreman and the dispatcher service, which is responsible for supplying the work places with everything needed (blank pieces, parts, instruments, blueprints)...."

But a book is a book, and advanced practice is advanced practice, and at our enterprise we have different policies. And I cannot rearrange my own work. Only the shop chief, in conjunction with the managers of higher ranks, can change the organization of labor of the functional services of the shop. And this is not so simple. After all, the planners, dispatchers and technologists of the shop are also conscientious in their work and they also have many unsolved problems. This is why a half-year ago their staffs in the shop were increased. But this in no way affected the work of the foremen of the forged section.

If the idea of the need for such a radical restructuring of the activity of the services and the line managers had come to me in the first months of my work there, I would have immediately told it to the shop chief. But now I understand too well how difficult it is to change everything. And therefore I do not suggest anything to anyone. But they cannot stop me from thinking.

Could the enterprise operate without any line managers at all? Imagine for a moment what would happen if all the line managers (if only as an experiment) were not to come to work and the plant had to fulfill the plan anyway. At first there would probably be chaos. And then a new policy and a new system would be established. The organization of the labor of the remaining functional services would be rearranged, and the enterprise would operate. The workers would still come to their work places and the section dispatchers would give them blueprints and give them the command to deliver blank pieces to the necessary place and so forth. The planners and technologists would prepare the work for the dispatchers. Who would be over the section dispatchers? Who would be responsible for the continuous operation of the equipment, and for the fulfillment of the plan of the section, shop and enterprise? All this is difficult to imagine "in a minute," since such questions, obviously, need detailed and generally thorough development. Perhaps even in collective discussion.

But it is undoubtedly necessary to organize the labor of the functional services in such a way as to provide for the fulfillment of the plan in the given volume and products list in each section and at each enterprise.

And then let the line managers come to work. They will finally be able to turn to the jobs that no one else can do. These include both strengthening discipline and introducing everything that is new and progressive--that is, everything that we do not have time for with our current work "for the plan." The foremen will engage in these matters on the scale of their section, the shop chief--on the scale of the shop, and the Director--on the scale of the enterprise....

At our plant today one can only dream about such a policy. And I am dreaming.... But I am working in the old way.

Within a year the entire shop will move to a spacious new facility with modern equipment: robots and manipulators, an automated warehouse for stamped pieces, and so forth. We should be glad, but I am not. And many other workers of our shop sadly say that it is easier to move to everything new than to change anything in the old place. But if the old policies and the old organization of labor are moved to the new shop, then everything will become old rapidly and routine will grow up.... They say that it is only one step from understanding the real state of affairs to the necessary restructuring, but how to take this difficult decisive step in our entire shop, where everybody understands everything, but they work in the old way?

I ask that the name of the enterprise where I work not be given....

From the Editors. The name of the enterprise will change nothing, for this "confession of a 'conservative'" gives a fairly typical picture of production life. We still think that the author is not a conservative, since his memory of previous, unimplemented plans for updating the sections still will not leave him in peace and he is not satisfied with the policy in production and he has his own ideas. But everything will be choked off if this person, who obviously does not have a large reserve of resistance to routine, is as before powerfully oppressed by the previous disorder and the old organization of labor.... What should be done?

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## MERITS OF CERTIFICATION SYSTEM EXAMINED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 157-160

[Article by F. Z. Azikhanov, Orenburg Polytechnical Institute: "Do Not Treat Everyone the Same"]

[Text] The system of certification and streamlining of workplaces, if it is put at the proper level and transformed from a goal into a means of achieving the goal, can become fundamental in determining the direction for reconstruction of enterprises. But so far the hopes that have been placed in it have not been justified. And they will not be justified as long as the conditions and methods of conducting the certification are dictated to the enterprises from outside.

The existing arrangement of this issue--imposing on the enterprises standard branch methodological instructions which in the majority of cases are palliative in nature and in no way differ from one another--cannot lead to increased effectiveness of the system. Only a creative target approach to certifying work positions and not standard thinking will help to fully reveal the potential capabilities of the collective of the enterprise and the system of certification as a whole.

Dnepropetrovsk workers have achieved great success in this area. Their experience deserves the most widespread dissemination, but we shall never achieve such success if we strictly follow the Dnepropetrovsk system. The experience of the Dnepropetrovsk workers should be regarded not as dogma, as is now the case, but as guidelines for action.

The enterprises should be given complete independence in conducting this work. They should not be given such assignments as to certify, streamline or eliminate so many work places by a given deadline. Such a statement of the problem leads to artificially increasing coefficients: the degree of certification, streamlining and elimination. High values of these indicators provide nothing for the enterprise or the society as a whole except for moral satisfaction of certain short-sighted managers. On the contrary, these instructions cause immense economic and sociopsychological harm and reduce the effect of certification to zero.

The enterprises should be given only monitoring goals and such indicators that could not be changed under pressure "from above," which is frequently the case in the existing system of certification. Once indicators are fixed they cannot be revised or changed.

In the existing system, such intermediate indicators as the number of certified work places depend on the role, authority and "weight" of the manager. And the manager makes a final decision that is remote from the issues of certification and streamlining of work positions since he can know about these issues only from hearsay.

An analysis of the methodological instructions coming to plants of various branches makes it possible to draw this conclusion: all of them are absurdly the same. Is it really possible to evaluate with the same characteristics all workplaces in machine-building enterprises, for example, of the Fourth State Bearing Plant (Kuybyshev) and consumer service enterprises? Are all the enterprises in the same branch really the same? Is it really possible to place the workplaces of an electronics worker and a welder on the same level? Such recommendations deeply delude the managers.

The evaluation characteristics of workplaces, according to which they are checked to make sure that they correspond to progressive solutions, should be selected at the enterprise. What is needed to increase labor productivity in a given workplace can be established jointly only by people who know it well: the worker who works in the workplace, the repair and service personnel in whose zone the workplace is located, engineering and technical personnel, the manager, but not the managers of the branch ministries.

In the existing system, local managers, having received methodological instructions from above, try to follow them strictly. An attempt on the part of the managers of ministries to introduce standards into the system should be regarded as poorly thought out branch methodological instructions. If they were well thought out, they would not try to recommend everywhere without exception, for example, a lifeless system of point evaluations of workplaces.

What is the purpose of the point system of evaluating workplaces? For moral satisfaction from the volume of work done to enter the "foggy brains" of managers and specialists of enterprises when counting up the values of group and integrated indicators for evaluation and when determining the class of decisions: to certify, to streamline or to eliminate the workplace.

It is precisely when determining the class of decisions that the branch methodological instructions diverge without justification. Some recommend certifying a workplace if the integrated indicator has a value of no less than 0.6 points; others--0.7; still others--0.875, and so forth. Yet there is no reason why one value of integrated indicator or another is accepted, or what deviations from these values will lead to.

Such a system of evaluations leads managers and specialists into a double deception. First, it remains unclear at which value of the integrated indicator one should certify the workplace. Second, there are various opinions about the question of allowing indicators that deviate in the

certified workplaces. Some think that it is permissible to have one deviation from progressive solutions while others think two and still others think three. For example, let us take the indicator of "working conditions at the workplace." It includes lighting, noise level, air temperature, concentration of toxic substances and industrial dust, difficulty and monotony of the work, and so forth. As a result, it may turn out that none of them correspond to progressive solutions but still the workplace is subject to certification.

I think that it is necessary to change over to a nonpoint system for evaluating the workplace. The essence of this method consists in that the workplace is certified only when all characteristics correspond to progressive solutions. Only such a method guarantees the quality of the certification of the workplaces.

Individual important aspects of certification that require in-depth analysis are not yet being properly reflected and are mentioned only in passing. This pertains above all to the stage of technical and economic analysis of organizational and technical measures. Here many people limit themselves to statements like: "The value of the workplaces and expenditures necessary for streamlining are being analyzed," as though this part of the work is of a secondary nature. And yet it is precisely on this that the ways and methods of streamlining depend and, in the final analysis, it is this stage that determines the efficient policy for technical reequipment of the workplace.

In the branch methodological instructions it is noted that there is a need to conduct a technical and economic analysis of measures for establishing the economic expediency of their introduction. But such an analysis is not always a sufficient condition for the adoption of rational decisions when establishing the secrets of the introduction of measures. Improvement of an individual indicator that characterizes the workplace can be carried out in several areas. In this case, in order to establish the most effective path for improving the workplace, it is necessary to evaluate each possible area, which requires multivariant calculations. The analysis in the branch methodological instructions does not envision ordering the measures in terms of the degree of importance. The measure that produces the greatest effect must be considered primary. Since the list of measures for certification always exceeds the financial and technical capabilities of the enterprise, it is also necessary to establish other priorities, for example, in terms of the level of management. Depending on the situation at the enterprise, the measures that are introduced at the lower levels of management can have priority over the higher levels of management (or vice versa).

The priority can also be established according to the effect of the rapid action. Here not only the economic factor, but also the psychological one plays a role. The collective is convinced of the usefulness and the need for doing work for certification and streamlining of workplaces. Priority should be given to those measures that are developed for the workplaces that are in the greatest "bottlenecks" of production.

Work for certification of workplaces in the country is in a complicated situation. Is it not turning into another campaign that nobody needs? This

depends largely on the USSR State Committee for Labor and Social Problems and its scientific research organizations....

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## WATCH METHOD OF TERRITORIAL ASSIMILATION REVIEWED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 161-174

[Article by I. P. Varshavskiy, chief of Glavzapsibzhilstroy (Tyumen): "Long-lasting Watch Settlements"; first paragraph EKO introduction]

[Text] We have come to these areas seriously and for good. This means that the appropriate conditions must be created for the people.... A primary task now is to take advantage of the new and immense possibilities and persistently conduct work for accelerating socio-cultural construction, and above all housing construction.

--From the speech of General Secretary of the CPSU Central Committee M. S. Gorbachev at the meeting of the party and economic aktiv of Tyumen and Tomsk oblasts

Two principles can be observed in the assimilation of the natural resources of the Tyumen Petroleum and Gas Complex: the creation of base cities and the expedition-watch method. Each of these represents a quite specific way of life and rates of development of the region as well as concrete socioeconomic results.

The base cities are a reproduction of the way of life in ordinary cities. For the builder and the petroleum and gas extractor this means: large-paneled buildings, facilities of the social and domestic structure, elements of the urban economy and buildup. Also, housing in the base cities costs from 500 to 800 rubles per square meter, and the initial one-time expenditures for building for one person, taking into account the sphere of urban services, amount to from 25,000 to 35,000 rubles.

Watches mean high rates of assimilation of new regions and the initial capital expenditures are less. But this means the way of life in field conditions, a home in a trailer, buildings made from beams (log cabins) and at best board buildings without any conveniences. The people are separated from their families and consumer services meet the norms of dormitories. All this determines the schedule for work and rest: a half-month of watch, then rest in the cities.

Today on the pipeline routes, the transportation mainlines and the built-up areas around deposits and regions of the northern part of Tyumen Oblast and the Middle Ob' area they have created approximately 1,480 field villages (watch settlements). They consist of 93,000 railroad car buildings of various types with an overall value of 0.7 billion rubles, and also board homes and log cabins and so forth. In connection with the further development of the petroleum and gas complex, under the 12th Five-Year Plan it will be necessary to increase housing in the base cities by a factor of 2.5 and to double the number of watch settlements and field villages. Yet the need for housing and social and domestic facilities in the base cities is being satisfied by only 60 percent under the 11th Five-Year Plan. We will not be able to close this gap in the near future because of the backwardness of the construction industry base. But because of the shortage of housing in the base cities, the field villages and watch settlements, which by their structure are intended for dormitories and short-term watches (up to 15 days), are being settled by families, primitive business structures and cabins are growing up, transforming these villages into population points with a low level of social and domestic services.

Thus it will be no exaggeration to say that the aforementioned two principles are adhered to only in theory. In practice, railroad car buildings and log cabins are also constructed in the base cities, and in the watch settlements they have been forced to construct kindergartens and schools. One can speak about direct economic outlays from the use of this temporary housing fund which has lost the indications of mobility, and it is also possible to struggle with the problem of energy supply and service for the population, and create numerous boilers in villages which are frequently next to one another, or one can adopt decrees that do not permit passage, and do not allow women and children in the watch settlements. But this path is ineffective.

#### The Long-Term Watch

Today the assimilation of new regions is dominated by the expedition-watch method which involves taking labor resources from other regions of the country. On the one hand, it is considered economically advantageous and is used everywhere. On the other hand, medical experts warn: frequent trips across time zones to other climatic zones certainly do not strengthen the health. Because of the specific nature of the labor, certain categories of workers have to spend long periods of time away from their families. Everyone says that this causes inevitable social losses. But are they so necessary in this case? Do all workers adhere to the watch conditions? Will a qualified specialist join the watch members? If he does, for how long?

The harm caused by labor turnover is generally known. Individual construction agencies working on the watch method, with the regular relocation lose from one-third to one-half of their personnel--and mainly because of the low level of the mobile infrastructure. Every worker knows that the first thing he must encounter in the new uninhabited region are difficulties related to the lack of minimum social and domestic services. Moreover, with the current organization of short-term watches, there are interruptions in the work, breakdowns in production and a reduction of rates. The outlays for transportation are significant.

How does one avoid the negative social consequences of the expedition-watch method? The solution lies in industrial methods and rates of construction of watch complexes. The latter should be located in the places where the labor is used and should satisfy the requirements placed on the sphere of social and domestic services, with partial retention of the principles of the mobile infrastructure. We are speaking about a long-term watch. It would be possible, for example, to have this work schedule: 1.5 years of watch--1 half-year of leave. The working conditions, the duration of the construction or the construction of the facility, and the technological and economic factors can also dictate a different length of time for the contract. Careful selection of personnel will help to obtain a maximum effect from such organization of labor. It would be desirable for members of the worker's family also to be employed either in the sphere of production or in the sphere of social service. Obviously, one should improve the social conditions and the conditions for concluding, dissolving and renewing the contract. But the main thing is that the worker, under the conditions of the long-term watch, can live with his family in the village where he is provided with the same level of social and domestic services. How is such a village created?

#### Unified, Comprehensive and Transformed

Watch villages are created near oilfields, gasfields and geophysical enterprises, construction industry enterprises, at compressor stations and in the "corridors" of pipeline routes. Just as a facility there are many villages as there are organizations. In other words, each organization constructs its own village. In our opinion, the village should be unified.

When the facility is being constructed, the builders should live in it. When the facility is turned over for operation, both the builders and the industrial operation personnel should live there. During this period, the population of the village increases significantly, but after it has been released for operation the construction workers leave and the number of residents decreases. Initially, there is a change in the number of residents of villages when a pipeline and its related facilities go to operation--simultaneously with the reduction or increase in the volume of production. In connection with this, the work of the village should be oriented toward the creation of an option stationary-mobile structure.

How do we envision this essentially new type of settlement? The stationary nucleus of the village consists of residential buildings and facilities for cultural-domestic and household purposes. Its mobile part also consists of housing and social, cultural and domestic facilities, but it is added to the village when the number of workers increases or moved to another place when the number decreases. Thus when constructing main gas lines, the mobile part of the village is always located between the compressor stations and gradually, as the front of line work moves forward, it shifts to the stationary-mobile village. The latter is located in the region of construction of the compressor station (which, as a rule, is built on in 2-4 months after the completion of the line section of the pipeline).

The ratios among the structural parts of the stationary-mobile village are determined by both external (production, climatic, geographic, transportation and others) and internal (mainly demographic) conditions. For villages of Tyumen Oblast, the ratios are: for the stationary part--60-90 percent, and the mobile part--10-40 percent.

How does one begin to create villages of the new type? One must say that up to this point there was no classification of watch villages and no unified concepts or terminology have been developed. Villages of the same type are called different things: field village, watch village, base village, watch complex and so forth. This discrepancy is predetermined by the diversity of the specific living problems of financing, planning, construction, operation and settlement. Some villages in Tyumen Oblast are characterized by more than 200 different specializations and enterprises! It is not surprising that attempts to categorize the planning structures and (economic) solutions have been rather so far off.

It would seem that the content of the long-term watch plans fails to solve the problem of how and to what end the regional system for construction of watch complexes, including the economic structure for the watch village, and design principles for buildings and structures, and establish the level of social-economic services. It should assign the average statistical level of small urban and urban-type settlements.

How is village growth to be controlled in relation to existing for conditions of the present point and the future? And to do this the design elements of the buildings and structures must be constructed in the form of block-structures. The financing of the construction of the village becomes an indispensable part of the financing of the production facility for it must be a needed part of the funds provided for the place facility or group of facilities.

The watch village-developing agency, which is unified, comprehensive and can be transformed, has developed the concept KTRV.

When Should the Complex Villages be Constructed?

The development of a general plan for the distribution of these villages is determined by two basic presuppositions: the four-stage system of international settlements and the local group system of distribution of complex villages. The former is determined by the general system of development and distribution of productive forces in the petroleum and gas extraction regions of Western Siberia. The latter is determined by the functional properties of the villages. Types vary: they are typical of the construction of complex watch villages: they are near already existing population points; they are near permanent transportation; and they are in an unassimilated region. In the first and second cases it is possible to take advantage of systems of social and domestic services of other villages. In the third case--which is the most typical--the village must be completely autonomous.

When distributing the new type of villages it is important to take into account the natural-climatic and transportation conditions of the region. A



no less important aspect are the capabilities of the local construction industry. By coordinating these three factors is it possible to develop a system of distribution.

When drawing up a plan for watch villages, it is necessary to recall the ratio between its stationary and mobile parts. The maximum effect is achieved when the mobile part serves only as an addition, and not an independent settlement. When the work front is winding down and the number of workers decreases, the mobile part of the village is shifted to the new facility, at which the number of workers is increasing to the "peak" amount. The living complex for the short-term recreation of the workers should be right at the production facility.

#### What To Build From?

The block-module plan is suggested as the main variant for the design-planning solution when constructing complex watch villages. According to this system the stationary part is made of three-dimensional block-modules that come ready from the plant. The mobile part is made of mobile modules. Glavzapsibzhilstroy has created a production base for manufacturing parts for industrial housing construction. It is spread throughout the Tyumen North in the cities of Surgut, Uray and Nadym. Possibly it would be more expedient to construct watch villages not only out of block-modules, but also out of reinforced concrete panels. One must say that under the conditions of Western Siberia the selection of a support base, the types of structures and the transportation routes for items and materials is always a difficult task. In each specific case it is necessary to determine once again, for again, the kind of transportation, the distance of shipments, the place of transshipment of cargo, and so forth.

The total expenditures on the manufacture of construction elements, their transportation, and the construction and operation of the watch complex are initially less close to a base city, and as they move farther away from it, these expenditures begin to increase more and more rapidly, and at some point they surpass expenditures for the construction of buildings made of wooden block-rooms.

Such calculations determine the zones for building up the watch complex: they are territories near base cities. It is better to build up all the remaining space with buildings made of wooden block-rooms. Then if the construction and operation of the watch building made of construction elements of the base city, even in this region, is more expensive than the construction from wooden block-elements, all of the watch complexes around such a base city should be constructed from wooden block-rooms.

#### The First Steps

Glavzapsibzhilstroy, in conjunction with the SibNIPigazstroy, for several years worked on the creation of fully prefabricated low buildings made of block-modules. The first block-module, which was 3 x 3 x 6 meters in size for two-story fully prefabricated buildings, was produced in 1981 at the Vinzilinskiy Plant for Construction Elements.

The SibNIPigazstroy Institute, on an assignment from Glavzapsibzhilstroy, within 5 months designed from block-modules a fully prefabricated two-story building with an overall dwelling space of 1,200 square meters. The preparations for adjusting production and producing an experimental batch were carried out at the Vinzilinskiy Plant in parallel with the planning. Actually, the reorganization for the output of the new products was done during the same 5 months of production. During the years of the five-year plan, the volume of output of products from the same production area almost doubled, and during this period it was necessary twice to make serious design changes in the products.

Thus they selected a promising, although also very complicated, path of development: to begin using industrial methods to construct well-arranged villages in petroleum and gas regions of Western Siberia that had difficult access. On the basis of the plant for construction elements and parts of the Ministry of Construction for Petroleum and Gas Industry enterprises, they organized the Vinzilinskiy Housing Construction Combine, whose task was to create a unified construction-assembly conveyor for constructing "turnkey" complex villages throughout the entire territory of Tyumen Oblast. But under the 11th Five-Year Plan the Vinzilinskiy Housing Construction Combine did not manage to become the "fashion center" in watch housing construction. This was caused partially by the shortage of capacities of large-panel housing construction in regions of Western Siberia, the arrears in the construction of the Vinzilinskiy Housing Construction Combine, and the most critical need for housing in the region.

Housing and again housing was demanded by the gas workers, petroleum workers, and the builders of the rapidly developing Novyy Urengoy and Noyabrskiy. The designing and construction of complex villages was postponed. In spite of this, under the 11th Five-Year Plan they managed to develop and construct a number of facilities for cultural and domestic purposes made out of block-modules: stores, dining rooms, administrative and domestic buildings, consumer service combines and so forth. A number of effective design and technological solutions were tested.

In conjunction with the laboratory for the application of aviation in the national economy of the Ministry of Civil Aviation, testing was carried out on special fittings and transportation and assembly of buildings made of block modules, were done successfully with the use of helicopters. In the future this will make it possible to carry out high-speed construction of villages in villages with the most difficult access.

In the future, we shall be oriented toward block-modules made of wood, and effective sheet and heat-insulating materials developed for us by the Siberian Zonal Scientific Research Institute of Experimental Design in the new experimental complex series of housing and cultural-domestic facilities. Now an experimental batch of these block-modules is being manufactured, and they are preparing for the construction of the first building. The designs that have been selected are more economical by a factor of 2-2.5 in terms of the expenditure of timber and by a factor of 8-9 in terms of the expenditure of metal. As a result of effective design decisions, the height of the space

within the block-module has increased to 2.8 meters. With two basic type sizes of block-modules (6.3 x 3 meters and 5.1 x 3 meters) it is possible to create the most varied and economical residential and cultural-domestic buildings as parts of unified complex villages. The apartments developed on the basis of this products list meet the requirements of construction norms and rules for stationary types of buildings and are intended to be inhabited with a norm of dwelling space of 9 square meters per person.

With various combinations of three-dimensional blocks it is possible to obtain all 10 of the types of apartments envisioned by the norms, in which the basic rules for zoning of residential and auxiliary premises will be observed. The list of block-modules of the complex series will make it possible to form stationary-mobile types of residences that are intended to be inhabited by single people, and also families of various sizes and compositions.

#### Domkomplektmontazh--The Regional Branch Industrial System

As we see it, in the future the Vinzilinskiy Housing Construction Combine should be assigned the functions of the unified general contractor for the entire technological cycle of "production--transportation--assembly--release of the 'turnkey' village" for the entire territory of the Western Siberian Petroleum and Gas Complex. Its duties could also include moving the rental, repair and installation of block-modules of the mobile part of the villages. A prototype of the proposed system could be the widely known Sibkomplektmontazh Association, which includes plants, assembly and batching enterprises, transportation convoys and mobile mechanized columns for erecting production facilities by the block-set method.

The block-set method has come to replace traditional construction. As was noted in the statements by participants in the round-table discussion conducted by the EKO editorial staff (Footnote 1), the Sibkomplektmontazh Association is in one of the decisive areas of scientific and technical progress. Such an organizational system is needed today in the sphere of construction of villages and facilities for the route infrastructure. By analogy, this organization could be called Domkomplektmontazh. The block-set method could produce no less of an economic and social effect when transferred to the sphere of the construction of facilities of the infrastructure.

In his speech at the conference of the party and economic aktiv of Tyumen and Tomsk oblasts, on 6 September 1985 General Secretary of the CPSU Central Committee M. S. Gorbachev noted that: "Taking into account the earmarked development of the economy up to the year 2000, the volume of the construction program in Siberia will more than double. A necessary condition for its fulfillment is priority technical and organizational-economic transformation of the material base, which would make it possible to transform construction into a unified conveyor, beginning with the manufacture of construction materials, construction elements and large block-modules and ending with their assembly into facilities that are ready for operation."

Our proposals concerning the creation of a new industrial construction system can be reduced to the following:

The optimal for the settlement of watch personnel employed in building up and constructing the petroleum and gas fields in Western Siberia is a long-term watch, and the optimal type of settlement is the unified complex transformed watch village. It is constructed from block-modules produced by the Vinzilinskiy Plant for Construction Elements of Glavzapsibzhilstroy.

Series construction of these villages requires a new type of organizational and production system. It is based on an industrial construction conveyor, which includes the complete cycle of "manufacture--transportation--assembly--and release of the 'turnkey' complex village."

The erection of watch villages in Western Siberia is a direct continuation of the block-set method applied in industry when building up gas and petroleum deposits. The method makes it possible to transform the construction site into an assembly site by applying three-dimensional blocks with an increased degree of plant readiness.

A complex village which has a flexible transformed planned structure can be used not only by construction and operations workers, but also by organizations of various branches and departments located in a radius that makes it accessible by transportation.

On the Vinzilinskiy Housing Construction Combine, it would be expedient to organize the Domkomplektmontazh Association, assigning it functions of the general planner, general contractor and client all in one. This will make it possible to reduce the investment cycle for the creation of the infrastructure when constructing pipeline systems and building up petroleum and gas deposits.

In order to provide for more rapid preparation of construction and the creation of the mobile part of the villages, and also in order to organize centralized rental and repair, it would be expedient to transfer all lifted mobile buildings when petroleum and gas fields of Western Siberia are built up to Glavzapsibzhilstroy. It would become the unified general contractor for the construction of housing and social, cultural and domestic facilities in this region.

#### FOOTNOTE

1. "At the Juncture of Industry and Construction," EKO, No 12, 1983.

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## ROLE OF TRANSPORTATION IN TYUMEN NORTH DESCRIBED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 174-183

[Article by V. A. Vasilyuk, senior scientific associate of the Siberian Scientific Research Institute of the Petroleum Processing Industry (Tyumen): "Transportation and Further Assimilation of the Tyumen North"]

[Text] Increased volumes of extraction of petroleum and gas in the Tyumen North depends to a significant degree on the development of the infrastructure and individual elements of it, particularly transportation, material and technical supply, and others. The proportion of transportation expenditures in the global social product of the region amounts to about 40 percent, while in the middle belt of our country this indicator does not exceed 10-12 percent. Such a significant difference in expenditures is explained not only by the complicated transportation system, but also by the influence of natural-climatic and economic-geographical conditions as well as the engineering and geological properties of the soil.

Further development of the transportation system in the north of Tyumen Oblast would require significant capital investments. But improvement in the existing system, with insignificant expenditures of public labor could appreciably increase the effectiveness of the process of transporting cargo.

What are the possibilities of this? Rail transportation should take care of more than half of the overall cargo flow in this region. The four end main lines (Chum-Labytnangi, Ivdel-Sergino, Tavda-Ust-Akha, and Tyumen-Surgut-Urengoy (which go out of the unionwide network into the depths of the region make it possible to take care of only a very small share of the through (mainly on the Tyumen-Surgut-Urengoy Railroad) shipments. And it is precisely these shipments that are most responsible for protecting the cargoes and increase the transportation and handling capacities of the railroads. Therefore it is necessary to take the path of containerization (including using containers on truck trailers) and packaging.

Construction materials comprise 30 percent of the overall volume of cargo shipped into the region. It is also possible to use containers, packages and pallets for transporting these and, because of this, to increase the protection of the cargo to 97-99 percent. Increasing the protection of the

cargo by only 1 percent (based on the volumes of cargo shipments during the years of the 11th Five-Year Plan) will make it possible to save 15 million rubles annually).

The next important measure might be accelerated development of sidings, terminal lines and loading-unloading areas. In Glavtyumenneftegaz at the beginning of the 10th Five-Year Plan, for every 1 kilometer of railroad siding constructed during a year, the average indicator of processing of cargo was 22,000 tons, and in the last year of the five-year plan--107,000 tons. At first glance this is a gratifying dynamic of the indicator of handling cargo. But if one looks more deeply, it becomes clear that the picture is not so favorable: the volume of cargo shipments increased, mainlines were constructed but sidings were not developed, and therefore the volume of handling cargo increased for every kilometers. The shortage was reflected in the time for processing the cars. The amount of idle time doubled as compared to the normative indicators.

The issue of the development of a network of railroads for interindustrial purposes, which joins railroad centers and stations to individual large deposits or groups of deposits, remains questionable. The dispute has gone on so long that, for example, in the Central Ob' area, they are late in resolving it. Here along both sides of the Tyumen-Surgut-Nizhnevartovsk Railroad they have constructed highways up to the deposits with permanent-type paving. This construction tendency remains even when petroleum extraction is shifting to the north. Thus in the Noyavrsknftegaz Association, they are constructing a year-round highway from the Surgut-Urengoy Railroad to the large deposits. Let us note that at these latitudes, as compared to the Central Ob' area, the distance between deposits is 1.5-2 times greater.

The following calculations show the expediency of interfield railroads as compared to year-round highways. The volume of earth-moving work in the construction of a railroad (interfield) and a highway with permanent paving is the same. When replacing the ballast and the wooden ties with reinforced concrete supports under rails on 1 kilometers of railroad, it takes 200 cubic meters of concrete, and for 1 kilometer of highway that is 6 meters wide, it takes 800 cubic meters of concrete slabs. In order to deliver 400 tons of cargo to deposit on the railroad, it takes one railroad engineer, and on the highway--40 drivers. The cost of shipping cargo on the railroad is one-fourth that on a concrete highway. The time of use of the rails with support under the rails goes into the decades, while the slabs on a highway last 8-10 years (without capital repair). When there is a decline in the cargo intensity (after the deposits have been depleted) the rails with a supporting foundation can be used over again on new railroads between oil fields (and the remaining bulk material can be transformed into a dirt highway) while the slabs covering the highway are quickly worn out because of the eternal frost, and they cannot be used again.

With a developed network of railroads for transportation between the fields, it becomes possible at the railroad centers, stations and even points for the delivery of petroleum and gas products, to form individual cars and minitrains (from one-two to 10 cars) for delivering cargoes to the deposit. This way the indicators for delivery of cargo without transshipment increased.

In our opinion, with further assimilation of the region, rail transportation should be the first to develop. This is confirmed by predictions of the assimilation of petroleum and gas deposits and timber and other resources during the period up to 1990 and the year 2000 in sparsely populated and uninhabited territories that are remote from population points and transportation. For example, for a continuous flow of products from the Kharpovskiye Crushed Stone Mines (Polyarnyy Ural) to the regions of new assimilation, it would be expedient to restore the Salekhard-Navym Railroad (300 kilometers).

Joining the railroad of the northern and central Urals to the regions of gas extraction will make it possible to accelerate the rail cargo flow to the north, reduce the cost of delivery of cargo, and use large quantities of construction materials from the Urals.

At the level of the more distant future there is the question of the construction of the Uralo-Pechora Railroad along the eastern slope of the Urals in order to ship timber (3 million cubic meters annually). In our opinion, it would be expedient to consider the question of constructing railroads from Urengoy to Yamburg and onto the Yenisey and from Nizhnevartovsk to Tomsk.

Petroleum and gas prospecting expeditions in Yamal at the present time are served by aviation and sea transportation (in the winter, by the icebreaker fleet). But when developing and working the nature deposits that have been discovered there is a greater need for material and technical resources and a railroad is required to provide for the cargo flow. The same type of situation with regard to prospecting and the assimilation of natural resources is developing toward the south from Gydan Island. The continuation of the railroad to the Yenisey will make it possible to deliver from its right bank highly durable construction materials for the Tyumen North.

Regardless of how extensively rail transportation may develop, the river fleet does not lose its economic significance. The configuration of the water network that is favorable for the assimilation of the region, the deep water sections of the rivers and tributaries provide the fleet with a great deal of handling capacity. The cost of cargo shipments by river transportation is considerably less than by rail.

River transportation in the Tyumen North has occupied and still occupies a leading position. Under the 10th Five-Year Plan the river fleet shipped 60 million tons of cargo to the North, including 11 million tons to the polar regions. Most of the river cargo flow is dry cargo (90 percent) and 60 percent of this are construction materials and 15 percent--metals. Under the 11th Five-Year Plan the river cargo flow amounted to 72 million tons.

During the years of the development of petroleum and gas extraction and other branches of the national economy in the region, small rivers were assimilated: the Agan, Vakh, Lyamin, the large and small Yugan, and others. Among the large rivers with guaranteed depths and high handling capacity are the Ob', Irtysh, Tura, Tobol, Konda and others. Transshipment capacities have been

constructed in Tobolsk, Surgut, Labytnangi and the village of Sergino. The level of technical support for the ports has been raised. The proportion of permanent docks in the overall structure amounts to more than one-third. Each year the indicator of loading increases by 0.2 tons per running meter of dock. But in the depths of the region (in the population plants, the bases and the deposits) the rates of development of docks are inadequate and therefore 50 percent of the cargo is unloaded on a poorly equipped or a natural shore.

At the present time, about 60 percent of all the cargo taken to Tyumen, Tobolsk, Surgut, Nizhnevartovsk, Labytnangi, the village of Sergino, Mezhdurensk and also Omsk, Novosibirsk and Tomsk is transshipped from railroads onto river boats. In the large river reports of the middle and lower Ob', the movement of the cargo flow in certain cases is impeded by the inadequate developed network of railroad-port sidings.

The development of river shipments is impeded by the uneven depths of the navigable sections of the rivers. Because of this, when delivering cargoes on the shallow (small) rivers it is necessary to transfer the cargo from large ships to small ones. Since there can be repeated transfer shipments of cargo, with river transportation, a special place here should be occupied by measures providing for protection of the cargo (containerization, packaging and so forth) or improving conditions for transshipment (highly productive transshipment complexes, completely comprehensively mechanized transshipment of cargoes).

Because of the relatively short navigation period (180 days) the effectiveness of the turnover of barges frequently decreases because of the lack of cargo to take back (especially in the polar area. At the same time, all the construction sites of the Tyumen North are experiencing a shortage of crushed rock and other inert materials. The problem could be partially resolved if they were to begin to utilize crushed rock from the Kharpovskiye mines more intensively. To do this it is necessary to organize the accumulation of crushed rock on the left bank of the Ob' near Labytnangi and to load it on empty barges that are coming from the polar area, along the Ob'. In the middle Ob' and the upper Ob', they would be unloaded. As an experiment, self-unloading devices could be installed on several barges (transporters, conveyors and so forth).

The most important task is to increase the productivity of the river fleet. In our opinion, to do this it would be expedient to prolong the navigation period. The navigation period can be increased by applying the ice cutter fleet on the rivers, which will be used as a patrol boat on individual sections of the main river lines. For example, the beginning of the navigation period in Tyumen (or Tobolsk) is 15 April, in Uray--20 April, and Nizhnevartovsk--5 May. The movement of the caravan of ships begins in Tyumen, and within 10-15 days they should arrive in the middle Ob' area, which almost corresponds with the beginning of the navigation period there. The ice-cutters will be needed only for the first caravans. The last caravan in the autumn can leave Tyumen on 20 October and, with the help of ice-cutters, can arrive in the Central Ob' area on 1-5 November. In this example the total navigation time increases by 30 days.



There are also other ways of increasing the handling capacity of the river fleet, for example, the use of hydrofoil boats and air cushion boats, and so forth.

The current handling capacity of the river ports of the Tyumen North will not provide for even half of the cargo flow in 1990, and by the end of the 20th century the river cargo flow will increase by a factor of 2.5.

In the future, the water cargo flows will increase at more rapid rates on the large and small rivers, and also on the Kara seacoast. Therefore, today special attention should be devoted to the development of water ports. It is necessary to do additional work to improve the port management in the cities of Nizhnevartovsk, Surgut, Urengoy, Nadym, Labytnangi and in the villages of Nezhdurechensk, Sergino, Novyy Port, Kharasavey and others.

In connection with the assimilation of the natural resources on the Arctic coastline an ever greater role is played by the northern sea route which, with the use of ice-cutters under the conditions of the Tyumen North, is becoming a year-round route. In the future liquified natural gas will be transported along this route. The shipment of natural gas by sea after preliminary liquefaction is a phenomenon that is becoming more and more widespread in world practice. According to calculations of academician A. G. Aganbegyan (Footnote 1), on the Yamal Coast, in the future it will be possible to construct plants for liquifying gas or a gas chemical complex. It will not be difficult to arrange transportation of valuable products by sea to the European part of the country and abroad either.

The expected development of the extraction of natural gas on the Yamal and Gydan peninsulas requires scrupulous development of a transportation system with preference given to sea transportation. At this latitude it would be expedient to use on a large scale pusher-tug units of a maritime type (lighters) and the construction of two-story docks (because of the changing water conditions both during the season and in various seasons of the year).

The Yamal Peninsula is served basically by sea transportation. The main sea cargo flows in the next decade will increase by a factor of 10 as compared to the present.

The highway network in the Tyumen North was formed depending on the concentration of natural resources. At the present time there are three separate networks of highways that are either permanent or seasonal: the Uray, Middle Ob', and Urengoy, consisting of roads with permanent paving (concrete), dirt or winter roads. The greatest distance of concrete roads is in the northern Ob' area and the shortest distance is in the Krasnoleninskiy Petroleum Extraction Region (Uray). In the overall structure, concrete roads cover 20 percent of the distance, and dirt and winter roads--40 percent each.

The need to increase the length of the highway network is becoming greater. Under the 11th Five-Year Plan alone as compared to the 8th the length of highways increased by a factor of almost 14). Such volumes of road construction work in marshes and on loose mountain rock as in the Tyumen North have not existed in any other region of our country. Therefore it is no

accident that new design solutions have appeared here, for example, the use of peat as a basis for the banks. In certain cases the banks are built by the hydraulic mechanical method. Synthetic nonfabric materials are used, and so forth. According to our calculations, the manufacture of paving slabs from local sand by the thermal processing method under the conditions of Nadym will reduce their cost by 50 percent as compared to those that are shipped in.

Glavtyumenneftegaz is most interested of all in the development of automotive transportation in the Tyumen North. It provides for 90 percent of the roads with a permanent type of paving. In the structure of its automotive fleet, trucks with a capacity of more than 5 tons comprise 60 percent. But the scale and rates of assimilation of the region require further increase in the proportion of trucks with capacities of more than 5 tons, specialized trucks (dump trucks, container trucks, vans, tank trucks and automotive loaders) as well as trailers and contrailers. Such a structure of the fleet and improvement of the mechanization of loading and unloading work will increase the productivity of automotive transportation, reduce the cost of cargo shipment and reduce the amount of idle time during loading and unloading.

A drilling brigade makes about five trips a year from one area of drilling of wells to another. KrAZ trucks are used for these purposes. Using a tractor, but sometimes by hand, the drilling equipment is loaded onto the platform in one place and is unloaded in another. The operation of loading lasts several hours. But in recent years, for relocating drilling equipment they sometimes use inappropriate technology and methods for loading the MAZ-7310 truck (Uragan). The loading is done only with automotive cranes, since the height of the Uragan platform is about 2 meters. It is necessary to wait, since the automotive cranes are not always available. The operation of rebasing lasts more than 2 days. It could be accelerated if it were possible to envision in the MAZ-7310 trucks mechanical or hydraulic devices for loading and unloading drilling equipment.

Under the conditions of the Tyumen North the level of indicators of operation of automotive transportation are lower than the average for the country. In order to increase the productivity of transportation and reduce transportation expenditures it is necessary to use better vehicles and to develop the network of highways.

Air transportation played an important role in the pioneering assimilation of the region. Many specialists and scientists thought that the sphere of application of aviation would decrease as ground and river transportation developed. But 20 years of active assimilation of the region have passed and aviation is still an important element in the transportation system.

The structure of the air cargo flow is composed of perishables and emergency cargoes (food products, equipment, instruments and so forth). Aviation is applied in mainline and interfield communications, construction and other spheres of human activity.

The technical capabilities of air transportation make it possible to use it more extensively for major cargo shipments directly from the suppliers to the place of consumption (to places with extreme conditions). This reduces the

time the cargoes are en route, which sometimes makes transportation expenditures on aviation more advantageous than expenditures related to the delivery and transshipment of these cargoes by other kinds of transportation.

In the future as well air transportation will occupy a certain place in the comprehensive development and improvement of the region's transportation system.

The transportation system should be augmented by new kinds of transportation (dirigibles, equipment running on an air cushion, monorails, pneumatic pipelines and so forth). The utilization of dirigibles as transportation and installation-lifting means facilitates the assimilation of the north. For they can take a cargo directly from the plant sites and deliver it to the place of consumption (place it on the routes of the pipes, move drilling equipment and so forth). They drift freely and hang and they can significantly increase the degree of industrialization of construction.

Equipment running on an air cushion can travel over marshes, shallow water and tundra sections, and, because of this, they open up the possibility of creating a system for year-round operation.

The acceleration of the cargo flow is influenced by warehousing and mechanization of loading and unloading work. With the existing transportation ties and the utilization of the basic kinds of transportation--river, automotive (on winter roads) in the regions of new assimilation, it is necessary to create annually (in Glavtyumenneftegaz alone) more than 30,000 square meters of warehouse space, and to improve their supply of computers for automation and mechanization of work processes in the warehouses. Through this we shall provide for mechanized preparation of orders, reduce the need for space in warehouse premises and improve their utilization, and also reduce the time periods during which the cargoes are in the warehouses as well as the need for labor force.

Thus it is necessary to provide for a comprehensive approach to the development of cargo transportation in the Tyumen North. Then conditions will be created for reducing expenditures, proportionally developing individual kinds of transportation, and efficiently distributing the productive forces of the region.

#### FOOTNOTE

1. Aganbegyan, A. G., "Zapadnaya Sibir na rubezhe vekov" [Western Siberia at the Turn of the Century], Sredne-Uralskoye knizhneye izdatelstvo", 1984, p 100.

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#### READER RESPONSE TO EKO ARTICLE

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 184-186

[Response from reader O.G. Oganov, division chief of the Soyuzremoborudovaniye All-Union Production Association of the USSR Ministry of Mineral Fertilizers to the article by K. K. Valtukh and B. L. Lavrovskiy, "The Country's Production Apparatus: Utilization and Reconstruction," EKO, No 2, 1986]

[Text] The 27th CPSU Congress named improvement of the utilization of production capital as one of the main reserves for economic growth. But K. K. Valtukh and B. L. Lavrovskiy, the authors of the article entitled "The Country's Production Apparatus: Utilization and Construction" (EKO, No 2, 1986) think that large reserves for increasing the output of products within the existing production apparatus has been exhausted. I cannot agree with this conclusion.

The production capacity is calculated essentially according to the greatest "bottleneck" in the technological chain. You have, for example, a shortage for the fulfillment of the program for machine tool hours of the milling machine or lathe group, and the rest of the equipment can be underloaded even on one shift. Nonetheless the calculation will be done on the basis of two-shift loading in terms of the "bottleneck." It is the two-shift work, that is, the reserve of work for the third shift that is not even considered.

During the one-time accounting for the country's production capacities, which was done several years ago, specialists of the USSR Gosplan conducted conferences in the ministries. At these it was recommended that capacities be calculated according to the "determining" group of equipment, that is, that which has the greatest technological load, and the rest should be loaded on three shifts, modernized, and installed additionally. In other words, it was necessary to widen the "bottlenecks."

Questions were naturally asked about whether such calculations could be used as a substantiation for the allotment of additional funds and material and technical resources. What about the shortage of machine tool operators? The answer that was given was that it was necessary to solve these problems independently. Understandably, under these conditions the accounting for the capacities in the local areas was basically done in the same way it had always been done, that is, according to the "bottleneck." But that is not all.



We are well aware of the experience of AvtoVAZ, where equipment is constantly being perfected and modernized, taking its operation into account. That is not the only place where this work is being done. And probably it will lead to a real increase in capacities. But, as a rule, this reserve for increasing the capacities of enterprises is not indicated in the annual statistical reports under the title "Balance of Production Capacity." The more so since it is not simple for an outside controller to check.

Another obvious reserve of capacities is linked to the peculiarity of the calculation--one determines the capacity of the equipment to process items of precisely the given products list. But in the stage of planning production, the products list is not optimized. Then in the stage of batching, up to one-third of the equipment is different from what is planned (and not only in terms of the makes of equipment, but also the groups). As a result, the actually installed equipment can deviate far from the optimal for the selected list of products to be produced.

In the stage of operation there can be a significant change in the products list itself. And, as a rule, these changes in the products list are made not in order to increase the production capacities, but on the basis of departmental interest in specific items. As a result, many of us practitioners of industrial management can give examples where the actual production capacity is less than that which is planned by dozens of percentage points.

In a number of regions of the country there are enterprises that are loaded by only half because of the shortage of workers with the appropriate skills. In many branches the machine tools are utilized on only one shift. From 20 to 50 percent of the technical equipment stands idle, waiting to be repaired. And here we have a phenomenon of statistical reporting: these losses do not exceed 16 percent of the capacities....

Or take this example. A large-scale production facility for ammonium has a planned capacity of 450,000 tons a year. Additionally, it is presumed that the annual repair with an interruption in the output of products will take 30-45 days. Moreover, there are unplanned periods of idle time whose total duration will be about a month (because of interruptions in the supply of raw material, packaging the prepared products, breakdowns of equipment). We know of foreign analogs of these productions where the installed capacity is 520,000 tons a year, the repair is done once or twice a year, there is practically no idle time, and the unloading of capacities because of deviations in the technological conditions are isolated instances. True, for this they apply a rigid system of technical supervision, diagnostic work on the equipment, and completely automatic monitoring of the conditions. But yet the capital expenditures on this are only a small proportion of the cost of the fixed capital and the advantage gained in utilizing the capacities can amount to 15-20 percent. The output-capital ratio improves by approximately the same amount.

Now an example from the area of machine building. Under the 10th and 11th Five-Year Plan the Ministry of Mineral Fertilizer Production constructed

several repair-mechanics plants (RMZ) in order to organize series repair mainly of imported equipment. Take the RMZ in Novyy Rozdol. Its planned capacity was 16.5 million rubles. The technology envisioned by the plan for repairing railroad tank cars for shipping liquid sulfur, stripping equipment and mining equipment is quite different from the actual technology. Moreover, in the process of constructing the plant approximately one-third of the machine tool fleet was unstaffed. The list of products that were produced was changed significantly. As a result, the losses of capacities can be estimated at 5-6 million rubles. It was possible to compensate for them partially as a result of creating boiler-welding production that produces chemical equipment and spare parts for it and also nonstandardized equipment with the capacity of 2-3 million rubles. After the assimilation of the capacities a recalculation was done, and at the present time the production capacity of the RMZ is 13.4 million rubles (taking into account the "compensation"). The losses of the capacities have become a part of history, and the output-capital ratio determined by the plan has clearly fallen.

There is one more factor which the authors of the article failed to mention. This is the decline in productivity of the new equipment per unit of its value. There are generally known cases in which new technical equipment is 2 or 3 times as costly as the preceding models but labor productivity is only 1.5 times greater. It is difficult to give a precise quantitative evaluation to this factor, but it can be done approximately. Understandably, this leads to an accompanying increase in the value of fixed capital with a reduced output of products.

As for the authors' assertion that the difference in the dynamics of the output-capital ratio and the coefficient of the utilization of capacities is related to the concealed removal of capacities, this in our opinion, is radically wrong. In practice, after each capital repair of equipment one loses approximately 5-15 percent of its productivity and reliability. This, of course, leads to a proportional drop in the output-capital ratio. But, after all, the coefficient of utilization of capacities also deteriorates to the same degree (since it is not recalculated here). Our branch provides an example. It is relatively young and was created on the basis of the most advanced technological processes in the world, and the average coefficient of wear and tear in the branch is about 0.3. That is, the effect of the factor of wear and tear should be minimal. But the ratio between dynamics of the drop in output-capital ratio and the coefficient of the utilization of capacities is analogous to the dynamics in the industry as a whole. Therefore when speaking about concealed removal one is speaking mainly about replacing outdated equipment and conducting high-quality repair.

Of course the production of mineral fertilizers is specific. On its current scale it was created during the past 10-15 years on the basis of the most advanced technological processes in world practice. A considerable part of these productions use sets of equipment imported from leading countries in the area of chemical production. Therefore, when one raises the question of resolving such economic problems through one's forces as a result of radically restructuring domestic machine building, as well as the entire investment complex, this is undoubtedly correct. But if one then forgets about the task of developing that part of the machine-building complex which should provide

for normal repair and renovation of production capital with spare parts, equipment, replacement units and also the corresponding mechanisms and technical equipment, then it is radically wrong. Such an approach does not make it possible to solve the problem of effective utilization of the main reserve of our industry--improvement of the utilization of the country's production apparatus.

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## WESTERN EXPERIENCE IN WORK AUTOMATION REVIEWED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 187-198

[Article by Academician A. P. Yershov, Computer Center of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk): "Automation of the Work of Employees; Experience of Developed Capitalist Countries"]

[Text] The changeover of the national economy to the path of intensive development is impossible without control on the basis of precise, complete and prompt information. A necessary stage on the path to the ladder is automation of the work of employees, even if it is only partial.

The traditional kinds of work of employees include management (administrative and financial), planning, scientific research work, education and the distribution of information. Directly related to this, but retaining a certain uniqueness are art and public health. The workplace of the employees and the place where the information they process is stored is usually called an office. The concept of an office has both a material component (office premises and equipment) and an organizational one. It can be an independent institution, it can be included in a large organizational structure or it can be an information-control unit in the sphere of production or service.

Today the relationship between the work of employees and other kinds of production activity is characterized primarily by a steady increase in its proportion. In the United States the proportion of employees (including 6 million salesmen) in the overall number of hired workers has increased from 18 percent in 1900 to 52 percent in 1980, amounting to 52 million people working in 3.5 million offices and receiving 60 percent of all the wages and public consumption funds of the United States, that is, \$780 billion. For production organizations, the cost of the work of employees occupies the leading place among the main items of expenditures of this kind of enterprise.

At the present time there is an increasing disparity between the tasks facing the office and its ability to carry them out. Human resources for extensive development of office work are close to exhaustion, and the increase in the labor productivity of employees during the past 10 years has been negligible: in the United States it amounted to 4 percent, as compared to an 83 percent increase in the number of workers. Various kinds of indicators of the



degradation of the existing system of organization of office work are beginning to appear. According to data of the Reliance Insurance Company, 25 percent of its human resources are wasted on the creation of paperwork, 80 percent of which is never used before it is destroyed or sent for storage. According to data of the transnational company Avon (35,000 workers and business in 30 countries), the average coefficient of the utilization of documents does not exceed 56 percent while 63 percent of the necessary documents are urgent, that is, they required delivery within a day after preparation. But the internal postal system in the company takes an average of 2.3 days to deliver documents, mail from a homework place takes up to 3.5 days, and general mail takes 4.7 days. On the whole, every fourth one of the most important documents is late.

One must say that office work became an object of automation almost simultaneously with its establishment as an individual kind of hired labor, that is, since the middle of the 19th century. Here are its landmarks up until the modern period: the steel pin, the typewriter, the telegraph, the telephone, the Dictaphone, the punchcard machines, fountain pens, Xerox copiers, Rotoprint. Some of these inventions went beyond the limits of special application and became universal implements that determine the appearance of modern civilization. At the same time they have not changed the nature of office work or its extensive development.

Beginning in the 1950's, electronic computer equipment came on the scene, developing at unprecedented rates. Its utilization in offices began in the 1960's and since the 1980's it has begun to determine the nature of automation of the work of employees. One can see three stages in the evolution of the office: the traditional, the production and the electronic.

The traditional office is not large, it consists of a collective of people who know one another, and who have a fairly broad range of duties. A good office is characterized by three signs of human work: a constant evaluation of the situation, initiative and rapid communication. The traditional style of operation of the office is stable during changes with a relatively small amount of work and in terms of a number of indicators it is well-prepared for changing over to the electronic office.

The production office appeared primarily in banks and large state institutions with a large volume of homogeneous work. It was based on the formalization of work, the singling out of specialized functions, detailed distribution of work, centralization of auxiliary work, and its organization along the flowline principle. The use of computers was organized similarly. It is based on the formation and maintenance of large supplies of homogeneous information and on mass calculations using this data. The destiny of automation in offices of the production type during the 1960's were individual tasks of organizational control at enterprises (ASU), financial activity and certain forms of information service (calculating wages, accounting for the movement of material values, automation of payments and utilization of financial instructions, reservation of tickets, bibliographic and information systems, information pools of supply and demand, and so forth). An important technical invention of that time was the automatic identification of clients using cards that contain the client's individual code, for example, credit

cards, and also the organization of financial transactions using special telegraph lines. As a result, for example, the number of telegraph transfers through the state network Fedwire from 1950 through 1980 in the United States increased by a factor of 30, amounting to 14 million transactions, for a total sum of \$78.6 trillion. The quantity of operations using credit cards in 1980 exceeded \$1 billion.

The production organization of the office has as its own drawbacks: it can increase bureaucratism and increase the volume of "paperwork." An investigation conducted in 1979 shows that each of the 48 largest companies in the United States annually spends an average of \$54 million to prepare reports for government agencies.

The electronic office is a concept of recent years. It is aimed at "total" utilization of the capacities of computer equipment in order to combine the merits of the preceding stages of development while eliminating their shortcomings. In practice, by eliminating intraoffice documents on paper and refraining from detailed distribution of functions, the electronic office restores the traditional form of concentration of work around the specialist or manager. The information computer capacities are also personalized while retaining electronic communications within the office and using centralized databases or remote subdivisions. There is a switch from the concept of the computer center to the decentralized network of automated workplaces.

The creation of an electronic office is a difficult thing. It places high demands on the quality of the technical and program support, and it requires careful accounting for the human factor and the peculiarities of the specific fear of activity in the office. But only in this stage can one essentially labor productivity and reduce labor expenditures (sometimes by a factor of 2). If the ordinary preparation of a business letter which is typed on a typewriter and sent by mail costs \$7, and with the utilization of a text processor--\$2, the composition and transmission of a letter through electronic mail costs only 30 cents. The electronic office, because of the electronic mail and portable terminals, provides for direct interaction among people without requiring their presence in the same place. For better or for worse, this erases the organizational and spatial barrier between office time and home time. Work at home or part-time work assumes a new quality. The almost concept of the "invisible collective" that was developed in scientific work is given a completely realistic content, greatly accelerating the rates of scientific research.

The concept of the electronic office opens up the prospects for an essential increase in the effectiveness of work of employees with a considerable proportion of creative work which at the same time requires intensive processing of large volumes of complexly organized information.

On the whole, the majority of offices have still retained the traditional form of work, with the exception of banks, insurance companies and commercial divisions of large corporations where there are offices of the production type. Automation of office work on the basis of computer equipment during the past decade has involved mainly junior and auxiliary personnel, already having caused appreciable changes in the structure of these occupations.

Full-fledged development in the direction of the electronic office requires an essential concretization of work operations and at the same time their presentation in generalized form in order for capital investments for computerization of each function to be justified by the extent of their application. In planning research conducted by one of the large financial organizations of the United States, they identified 38 generalized functions of the electronic office.

Naturally, this diversity of functions requires a certain grouping and a singling out of key functions as objects of automation. Specialists single out eight of these functions: text processing, electronic mail; personal computers and terminals; recognizing and processing verbal information; electronic storage of documents; transfer and processing of facsimile information; remote conferences; and the utilization of general communications systems. Many opinions concerning the essence of the electronic office can be expressed in a more compressed way by singling out a triad of the most important functions that are subject to joint and interconnected information: electronic communications, electronic document storage, and electronic document communication. This triad includes everything else.

In terms of the question of the criteria of the effectiveness of automation of the work of employees, there is no unanimous opinion yet. A number of organizations out of habit tried to place at the top of the list net savings of expenditures on administration. This approach, however, suffers because of its limitedness and can lead to strategic mistakes. According to estimates that have been made, under the conditions of the industrial enterprise automation of the work of employees can reduce the overall expenditures on the office by approximately 25 percent. The "first wave" of return can be obtained as a result of large capital investments in the work of employees, which now lags greatly behind industrial production in terms of capital-intensiveness. But the most important and realistic goal of automation of the work of employees is improvement of the quality of administrative and planning decisions that develop in the office.

There are two stages in the creation of an electronic office. The first is "electronization" per se, which consists in transferring the information base and document turnover to machine carriers, moving information computer equipment to the workplaces, and providing for electronic communications among the workplaces and points of origin of information. This is the most capital-intensive stage to which, unfortunately, the process of automating the office does not always completely lead, thus dooming all other measures to failure. The second stage is the organization of the functioning of the office under the new conditions, which is carried out mainly through programming, training of personnel, and the creation of new organizational procedures. This stage requires the least expenditures, but the most painstaking work and it is the most highly "knowledge-intensive."

As distinct from preceding stages of automation, the main thing here is the increased effectiveness of the work of managers and specialists. No less than 15 percent of their time can be saved as a result of reducing waiting time, superfluous phone calls, interruptions, paperwork, running about, and other

similar factors. Most of the work can be more effective because of the direct machine support.

Research of the Rand Corporation showed that an important criterion for success in automation of the office is a self-evaluation of the work conditions of the workers, in which they single out, above all, four factors:

functionality--the degree to which the system is introduced naturally and easily, changes, organizes and stores information;

the work capacity of the equipment, including the speed and quality of repair;

the interactiveness--the convenience of communications with the computer and with one another;

the office situation--convenience, location of equipment, space and furniture.

In research conducted by the Xerox Corporation it was discovered that when the work of employees is automated with personal computers it is necessary to precede along the path of more or less direct imitation of the devices that have become customary for workers during the homework period. Text processors should be presented to the individual as a convenient typewriter with additional capabilities, the surface of the screen should reproduce the image of a desk, and the screen presentation of the document should be close to its actual physical form. The human being's work at the terminal should be of a manipulation nature ("Look and act, and do not memorize and gather text").

#### Technical Means of the Electronic Office

The technical means of the electronic office are organized according to the mainline-network principle. Their most dispersed components are the work stations installed at the workplace of each worker. The future workstation is a personal computer (Footnote 1), which combines information computer resources and means for entering and reproducing information.

Many workplaces are now equipped with terminals that hook up to minicomputers that work under time-sharing conditions. Historically, the debate has apparently been won by personal computers that are joined together to a network, but now there are many organizations that prefer time-sharing (for example, with constant work with large centralized information supplies, when they turn frequently to large-volume computations, or when they are working with very large programs).

The next level of the hierarchy is formed by centralized means of collective use that are joined into a common main terminal or are located in the center of a star-shaped juncture of workplaces. The means are centralized either out of economic consideration (for example, a high-quality laser printer or one with high productivity, a high-quality machine graphics station, a communal disk memory), or if they are a concentration of unique information (central data banks).

The technical means of the office can have entry into a large computer or into



a data transfer system. In turn, the office can receive dispersed information that comes from gauges--indicators of the production process or experimental installations.

Communications. When automating the work of employees it is necessary to distinguish between intra-office and interoffice communications. The latter are closely linked to the general development of communications in the society. Departmental systems of numerical or special communications, as usual, determine the technical progress of the communal ties, but with a gradual change of the latter to numerical control and numerical coding of audio and video signals. By the end of the century departmental systems will merge into a general global system. According to predictions of the U.S. Postal Service, in 1990 109 billion of the 132 billion pieces of correspondence will send ordinary letters and 23 billion will send letters through electronic mail. By the year 2000 for the first time the proportion of ordinary mail will be less than that of electronic mail: of the 161 billion pieces of correspondence ordinary mail will account for 75 billion and electronic mail--86 billion. By that time there will be a unification of telephone and computer equipment in the apartment into an integrated work station. As a combined device it will perform improved functions of the telephone, transform textual and voice communications, make connection with the operator and play the role of an interoffice intercom.

Documentary production. Printing devices are undergoing evolution in two directions: consolidation of printing devices for collective use that provide for high quality and productivity of print, and a simultaneous reduction of devices with their distribution in the workplaces while maintaining the quality of print at the level of typewriting.

In the first direction the laser printer is becoming the standard device. Based on a screen display of letters and graphic information, the laser beam, modulated by this screen, with great speed and a high level of resolving capability (from 100 to 250 lines per centimeter) bodes a Xerodrum from which the text and the depiction are printed by the xerography method.

In the second direction, there is a predominance of matrix printers in which dot print is used. For the vertical dimension of the letter it allots 7-9-15 pitches, sometimes with a half-step shift. The 15-pitch print, which corresponds to a resolution of about 15 lines per centimeter, makes it possible to print with the quality of a good typewriter any text, including hieroglyphs. A number of companies are producing three-color printers that make it possible to reduce color depictions designed on a display screen.

#### Software

Automation of the work of employees and personalization of information computer means that are constantly at the disposal of the worker radically change the nature of the utilization of computers.

All the manipulation of the work with the document changes sharply. But it still remains possible to think of new work in old concepts, which does assume a metaphorical nature.

Of these metaphors, the one most common is the "desktop metaphor," whereby the surface of the screen imitates the surface of a desk with papers scattered over it.

The physical surface of the screen is thus broken down into partially overlapping rectangular "windows." Each window reproduces the document partially or completely while retaining, if necessary, its textual structure. The control of the cursor or the keyboard make it possible to move the document manually over the screen, move to the next window, edit them, and bring the necessary documents into the foreground without losing sight of the others. The available sizes of the screen and its resolving capability make it possible to conveniently have up to 10 documents in view on the screen and an even larger number "in the background." A fragment of a document in each window is edited by an arsenal of means of screen editing.

Another metaphor that has become widespread and has even led to a special style of work on the computer is the metaphor of the "spreadsheet." The classical representative of this is the Visicalc Think Program. Its authors made a correct observation: a large number of calculations made by employees look like the manipulation of data gathered on a two-dimensional table that can be seen with one glance and reproduced on a computer display screen (an electronic form). There are many interpretations of the technique of manipulating electronic forms.

The initial means of automating the work of employees made it possible for the user to load only one applied program in the work station. Yet sometimes the employee is doing several things at once or doing some complicated activity that requires a diversity of programs. This kind of complex activity has conventionally been given the name of a "project." The integration of several applied programs into one project became possible with the increased parameters of the work stations both in terms of memory and in terms of speed.

Automation of the work of employees reaches its maximum effectiveness only when it includes the activity of the office as a whole, that is, when it assumes the nature of a system. In the stage of the office of the industrial type as in the subsequent one, integration of work stations into an office system is a matter of individual planning that is carried out through the efforts of the organization itself. Naturally, such an approach is appropriate only for very large offices. During recent years, however, the producers of computer equipment have offered sets of equipment and software that already comprise a system of medium size that claims to be moving in the direction of a standard integrated electronic office.

Automation of the work of employees is a global phenomenon and, as such, it should be carried out in close connection with the development of the society, with the orientation toward the achievement of social goals and with the objectively established balance of possibilities and requirements. It is known that the demographic situation in the USSR in the medium-range future will require a maintenance or even a certain increase in the rates of entry of human resources into the production sphere. Therefore a reduction of the number of people employed in management labor or serving this sphere is not

only a means of "fighting against bureaucratism and petty office work," but also a source of working hands in production. This problem can be only partially resolved by changing the structure of management. A more constant source of this kind of release of workers should and can be automation of the work of employees.

In the sphere of technical support for automation, the main task is providing for mass production (up to a million a year and more) of microprocessor computer equipment, and especially their components: integrated circuits, television monitors, magnetic memories, keyboards and printers. It is also necessary to achieve repair-free service, whereby any breakdown is neutralized by immediately replacing the appropriate type of element.

#### FOOTNOTE

1. In addition to the aforementioned personal computers, the technical means of the electronic office includes portable computers. There are two levels of design solutions here: miniaturization of desk systems (the suitcase variant) and enrichment of pocket calculators (the portfolio variant).

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## MACHINE BUILDING FOR LIGHT INDUSTRY DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 199-206

[Article by A. A. Makhorin, candidate of economic sciences, All-Union Scientific Research Market Institute of the USSR Ministry of Foreign Trade (Moscow): "Machine Building for Light Industry: Structural Rearrangement"]

[Text] Machine building for light industry in capitalist countries is included among the science-intensive branches of industry. During 1970-1985 the proportional expenditures per one employee in textile machine building in these countries (and this is the largest branch of production of machines and equipment for light industry) more than tripled. Moreover, the ratio of expenditures for scientific research in the United States, the FRG and other developed capitalist countries, is constantly changing, thus reflecting the irregularity of the development of the production of equipment for light industry in them.

Scientific and technical competition during the past decade--the period of the deepest crisis in capitalist machine building during the postwar period--has assumed a pivotal position in the struggle of machine-building companies for foreign markets. Its cutting edge has shifted to the sphere of research and development, where success in production and market activity is predetermined. For example, the leading position of West German producers of textile equipment in the world capitalist market is explained to a considerable degree by the fact that they spend considerably more money on scientific research and experimental design work than do their competitors, and also the high degree of effectiveness of the utilization of this money. It is known that the FRG spends approximately 2.5 times more money than the United States, and almost 6 times more than Great Britain on scientific research and experimental design developments in textile machine building.

Today machine building for light industry is under the influence of a number of new factors and processes. These include intensive development of light industry in the developing countries and the activization of their struggle for equal rights in the area of international trade; the aggravation of structural and cyclical crises; the strengthening of the struggle of the working class for a higher standing of living; and the sharp aggravation of the competitive struggle on the foreign markets. As a result, the structure



of the reproduction of light industry products is changing; the list of machines and equipment has been updated to a considerable degree, mainly those that are sold on the markets of developed capitalist countries. Items with such qualitative characteristics as a high level of automation, small energy-intensiveness, economy and the consumption of raw and processed materials, indispensable insurance of standards with respect to level of noise, air pollution and so forth have acquired great significance.

Light industry developed rapidly in the Third World countries during the 1970's. The average annual rates of increase in the output of its products during that period was approximately 4 times greater than in the developed capitalist countries. The entry of a number of developing countries onto the markets of industrially developed capitalist states with inexpensive light industry products led to the development of at least two phenomena: first, there was an increase in protectionism with respect to the importing of light industry products from developing countries and, second, the monopolies developed measures to reduce outlays for the production of products, mainly with respect to labor force, since the increased struggle of the working class for its rights led to increased nominal wages in light industry in industrially developed capitalist countries: during 1975-1985, they increased by a factor of 1.8-2.1.

It should be noted that this increase in wages does not mean a corresponding increase in the standard of living of the workers, since retail prices increased rapidly.

The increase in wages in light industry of capitalist countries outstripped the increase in prices from machines and equipment for this branch. In order to obtain higher profit, this contributed to streamlining of production through replacing the worker with the machine with a high level of automation.

In the United States the average annual increase in wage rates in light industry during 1975-1984 reached 5.5 percent while the increase in wholesale prices for light industry products amounted to about 5 percent during this same period.

The process of automating technological processes in light industry has taken hold everywhere. In particular, this was brought about by the equalization of wages in the countries of Western Europe, Japan and the United States. Thus in 1984 the level of hourly wages of workers in light industry in Belgium, Norway, Switzerland and Holland was 5-12 percent higher than in the United States, and in other industrially developed capitalist states it was close to the level in the United States.

#### Two Faces of Automation

As we know, the crisis entails an aggravation of the struggle for the sales market, which serves, in the first place, as an additional incentive for producing equipment that provides for a reduction of production expenditures and, in the second place, to the appearance in the phase of depression of prerequisites for reequipping enterprises with new equipment. Under modern conditions this phase takes a fairly long time. This is caused by the

interweaving of structural and cyclical crises in light industry. This is why mass updating of fixed capital in the branch takes place in precisely this phase of the cycle.

An increase in the disparity between the times for wearing out and obsolescence has forced the monopolies to make large capital investments in modernization of equipment. Thus they have formed a potential demand for many kinds of modern kinds and models of machines that were previously not produced. As a result, in the production structure of capital investments there has been a considerable (up to 85 percent) increase in the proportion of expenditures to make up for the withdrawal of fixed capital with a reduction in the proportion of investments intended for expanding it. Moreover, in all industrially developed countries, the increase in fixed capital has been accompanied by a reduction in the fleet of machine tools and machines as a result of their replacement with more effective, productive and costly automated equipment that makes it possible to increase the output of products with the reduction of the number of people employed.

The proportion of expenditures on means of automation in the overall expenditures for the acquisition of new equipment in light industry of industrially developed capitalist countries has increased significantly in recent years. It increased from 12 percent in the middle of the 1970's to approximately 27 percent in 1985. In recent years there has been an increase in the proportion of capital investments used for replacing outdated kinds of equipment with new, highly automated machines. It has accelerated the formation of the demand for new kinds of machines that are equipped with means of automation and has thought about the development of new kinds of equipment that satisfy market demand.

Equipment that has computer technology makes it possible, according to data of the Swiss consulting firm Gherzi, to save 20-30 percent of the labor expenditures in light industry. At the present time any technological process in the branch can be regulated with devices for processing information.

In spinning production, production processes are being increasingly regulated with computers. Thus the Schlafhorst firm (FRG) has created a pneumomechanic spinning machine called autokoro, in which practically all the technological operations are automated. Automation of operations of the cleaning chamber and drying of the broken yarn became possible because of the creation by the Zussen firm (FRG) of the klinket and spinket devices. Using these devices on machines makes it possible to increase the service zone of the spinning workers from 600 to 2,000 spinning cells. The idle time of cells, because of breakage, decreases and, when working according to a given program, these devices provide for a minimum of breakage. The autokoro is equipped with an automated remover which gathers the used bobbins full of yarn and installs empty molds, and it also has a system of electronic program control. In spite of the high cost of these machines, in 1979-1984 the Schlafhorst company considerably increased their sales, even in spite of the unfavorable market conditions during 1980-1983. Because of the increase in demand for these machines, the company has increased their output from 28 to 36 per month.

Microprocessors are being utilized more and more actively in the painting and finishing production. The West German firm Tis first developed in 1982 an electronic system for control of processes of painting and finishing called Polimitak. Precise regulation of technological processes makes it possible to cut losses of dye in half, to reduce the time for finishing and expenditures on energy considerably, to improve the quality of the items, and to significantly reduce the number of service personnel.

Electronic equipment is being used ever more extensively in knitting equipment, where it is used to select the needles and form the pattern. In equipment for sewing production automation has affected not only auxiliary operations but also the systems for controlling the machines. For example, Japanese firms have created and are producing machines for working according to the contour of footwear and haberdashery items that are equipped with a self-teaching system of electronic program control.

In order to automate universal sewing machines that comprise the basis of the machine fleet of the sewing industry, at the end of the 1970's they began to actively introduce gears that are equipped with an electronic control system that makes it possible to regulate and automatically maintain a given speed of sewing. Standard means of automation of auxiliary operations, according to the West German firm Psaff increased productivity when making, for example, tucks--by 40 percent, and pockets--by 33 percent.

In the footwear industry they are also more and more extensively utilizing automated equipment with program control based on microprocessor equipment. Since the beginning of the 1980's Italian firms have been producing highly automated machines both for cutting materials and for processing parts of the tops and bottoms of the shoes. The changeover to the utilization of means of microelectronics in the footwear industry has provided for an increase in labor productivity of 30-40 percent and also for more efficient utilization of raw material.

In order to automate equipment for light industry, in addition to computers, at the end of the 1970's and the beginning of the 1980's, the monopolies began to actively introduce industrial robots. They are used mainly for automating auxiliary operations (transportation, loading, unloading) and also for performing narrow specialized tasks (putting semimanufactured products into the equipment, joining the ends of broken threads, removing the final product).

One of the producers of textile equipment that has begun to produce robots--the Italian firm Savio--in 1982 put its first robot on the market, Ernest I. It used for unloading combing machines. Another model, Ernesta I, provides for transporting the bobbins. It is expected that the output of robots used in light industry will increase several times over by the end of the 1980's.

The growing use of robots will be an important stage in the solution to the problem of comprehensive automation and mechanization of light industry and the creation of fully automated productions. Such enterprises already exist. Thus Japan has created an experimental, fully automated (using robots with microprocessor control) spinning factory.

Automatic preparation of the machine for work, its adjustment and control over the technological conditions and the quality of the products that are produced has significantly simplified the functions of the worker and given him the opportunity to concentrate his attention on the basic operations and expand the number of pieces of equipment he runs. But while creating conditions for increasing labor productivity and contributing to solving economic problems of the branch, automation of production has simultaneously aggravated the social contradictions between labor and capital. The army of the unemployed is being increased with new underprivileged people who have been crowded out as a result of the utilization of machines with a high degree of automation. It is known that their application makes it possible to reduce the number of people employed by a approximately 10 per 1 machine. According to figures in the newspaper DAILY NEW RECORD, during the first half of the 1980's the reduction of labor force in light industry in capitalist countries amounted to 18 percent. In the future this process will become even more crucial, since it is expected that by 1990 the development of technology will make it possible to create automatically controlled productions, including textile productions. Thus in Japan it is intended to create a fully automated factory for producing clothing. The American firm Stanwood Corp., which produces work clothing and clothing for recreation, intends by 1990 to transform its 14 enterprises into six with a high level of automation and robotization.

#### Increase in Prices for Raw Material

During 1974-1983 there was a considerable increase in prices for textile and other kinds of materials. Thus the price of long-fibered cotton fabric during 1972-1983 increased by a factor of approximately 1.7, wool--2.86, and so forth. Because of this it has become crucial to reduce the material-intensiveness of light industry products. To this end machines and equipment are being provided with various mechanisms and devices that reduce losses of raw material during the manufacture of items. A typical example of this restructuring is the modernization of knitting equipment. Knitting machines are now equipped with mechanisms that force the release of the thread and halting, and antishock needles that reduce the losses of raw material. Swiss, Japanese and West German producers of knitting machines are developing designs of automated flat knitting machines that are capable of knitting parts according to the contour, that is, that do not require cutting, which is where up to 10-15 percent of the raw material goes to waste.

An important direction in the reduction of material-intensiveness is the development and output of machines and equipment for processing wastes from light industry. The utilization of secondary materials makes it possible to considerably reduce expenditures on raw material, which is important, since the cost of raw material comprises two-thirds of the cost of the yarn. To obtain yarn from secondary fibers, spindleless looms are being created. The Austrian firm Ernest Fehrer produces equipment on which all kinds of waste are processed. Chemization of the raw material base for the branch also has the effect of saving on materials. This has made it possible to reduce consumption of natural kinds of fiber that are in short supply and are labor-intensive (cotton, wool, bast fiber and natural leather) and to increase the proportion of chemical fibers and mixtures of these and natural fibers.



The structural changes based on the more rapid development of productions that use synthetic kinds of raw and processed materials and the latest technology are apparent from the example of the footwear industry. Thus in industrially developed states, with an overall absolute reduction during 1970-1984 of the volume both of all footwear (by 5 percent) and the special category, leather (by 13 percent), the output of footwear from various materials capable of replacing natural leather, increased by 18 percent, and the average annual rate of the increase during this period amounted to 1.7 percent.

#### A Compulsory Measure--Energy Saving

The energy crisis and the sharp increase in the prices of oil it caused during 1973-1974 and 1979-1980 led to an increase in the proportion of expenditures on energy in the overall outlays for producing light industry products. These expenditures in many subbranches at the beginning of the 1980's amounted to 10-14 percent of all the production outlays. A sharp reduction of the price of petroleum and certain other kinds of raw materials at the beginning of 1980 only somewhat alleviates, but does not remove from the agenda, the problem of reducing energy consumption, since in the future it is expected that prices will increase because of the fact that the resources cannot be restored as well as inflation and other factors.

This need stimulated the creation of equipment for processing textile and other materials used in light industry with energy-saving technology. This pertains first and foremost to textile equipment used in energy-intensive finishing productions. Up to three-fourths of the energy consumed in the textile industry is used here. In the designs of dyeing and finishing equipment a great effect is produced by the utilization of organic solvents which provide for a reduction of energy consumption as a result of intensification of the technological process and increased evaporation capacity of the liquid medium. According to estimates of the newspaper DAILY NEWS RECORD, there will be a considerable (up to 30 percent) reduction of the expenditure of energy resources as a result of using finishing equipment for economical application of solutions on fabric.

Increasing the speeds of equipment has aggravated the problem of noise at light industry enterprises. Indicators of the noise level of equipment and the degree of dust in the air have become parameters for the competitiveness of machines and equipment. Standards adopted in the United States and other industrially developed capitalist countries have established that the noise level in the shops should not exceed 90 decibels. The standard has required the development and output of machines and equipment with new designs units that encapsulate the units of the machine as much as possible, sound insulation in walls, flat belts, and so forth.

Thus in the second half of the 1980's changes are taking place in the distribution of labor among the individual units of production in light industry and capitalist countries. They have been brought about by the rapid introduction of the latest achievements of science and technology at enterprises of the branch and the creation of new, highly automated productions. In turn, the demand for new kinds of machines and equipment that

appeared from light industry has led to a structural reorganization of the production in the branch.

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## GREED IN DISPOSAL OF WASTES SATIRIZED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 2, Feb 87 pp 221-222

[Article by Saveliy Tsylin (Kharkov): "The Refuse Heap"]

[Text] The light in the office of the combine is never turned off, even during the day. In front of the windows there have risen up such heaps of waste rock that the sun has not been able to shine through for about 15 years. Flowers do not survive here for more than a week, and workers--for more than a year.

One day the director cast his customary glance toward the window and froze--in the distance a couple of strange workers were loading an unfamiliar dump truck. Moreover, strange as it may be, they were taking the rock out of the refuse heap. He sent his secretary to find out what was happening.

"They say that our wastes are a real treasure for them, the chemical workers. They ship this kind of raw material over thousands of kilometers. You know, they are also digging on the other slope--the construction workers. They have found that this is excellent raw material for them, and now they do not have to build a mine or a keramzit plant."

"Just look!" The director was surprised and rubbed his hands together. "Right to the trust: 'Because of our initiative and efforts the problem of protecting the environment around the combine has successfully been resolved. We have discovered the effectiveness of our wastes in chemistry, the construction industry and other branches. We are intensively salvaging the refuse.'"

The trust was glad to receive the information, reward the director with a month's salary, and used it as an example for other administrations. He became a hero of the trust, and all the time the trucks were taking away the refuse heap like aunt. Agronomists even appeared and established that these wastes could serve as potassium fertilizers. Somebody's excavators sneaked up and began to work day and night gnawing with its toothy mouth into the rock and spitting it out into the dump trucks that were continuously arriving.

The senior planner suddenly flew into the director's office.

"Nikolay Semenyich, when you were just sitting there calmly looking at this looting in the clear light of day?!"

"Calmly? Not only that--with satisfaction! They are cleaning up for us and we get the bonus. What is wrong with that?"

"But that is looting! Right out from under our very noses, as it were!"

"Well, let them. Those are wastes, to hell with them."

"For us they are. But for others they are Klondike, a gold rush. No, we must sell them, only sell them!"

"Well, that's a thought. If only at 10 rubles a ton, that would still be a profit. Do the calculation."

Soon a fence with a gate rose up around the refuse heap. The vehicles continued to come one after the other. The director went into his office and saw: through the glass that had never been washed timidly peeked a little ray of sunshine. A limp flower on the windowledge came to life and reached upward. The workers began to take back their resignations.

"A catastrophe!" The planner ran in. "We have not put the second line of our production into operation and we do not know when we will do it. But the plan for it has already arrived."

"I know, but there is nothing we can do," the director sighed in resignation. "We have done everything we can do."

"Try to prove that to the management! But there is a solution! How much of our product do we produce? Hundreds of kilograms! And how much waste do we have from this? Hundreds of tons! and so, what is the obvious solution?"

"What?"

"To include these co-called wastes from our basic production!"

"And our reagent--will that be waste?" The director was sarcastic.

"In any case it would be a forced output, a byproduct and we could set the prices for the wastes at whatever we wanted--three times as much. Then we would make the financial plan! I do not see any other way out."

"Genius! Prepare the documentation."

Within the quarter the directorate had received a bonus for expanding the list of products and overfulfilling the financial plan. But the flow of vehicles to the refuse heap began to dry up. And then the price of "universal," as they began to call the wastes, was again doubled--the line completely disappeared. The last to steal away was the excavator. The gates closed behind it and the road began to grow over with grass.



In vain the director sadly looked through the window of the office--they were all gone. Once a random dump truck out of habit pushed itself through the gates but it immediately remembered and turned back. The director ordered someone to catch up with it and bring it back.

"At that price you can eat your refuse yourself!" the expediter explained, crudely but effectively. "Now it would be cheaper for us to get this raw material from the land of Franz Joseph...."

The reflection of a ray of sun sadly flickered from the refuse heap and then died out.

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